The Builder.

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MANY, doubtless, remember the time when the only shape in which India-rubber showed itself in this country was that of crooked and twisted little bottles, off which slices were cut for the use of those who desired or required to obliterate pencil-marks on paper. Even the first decided step towards the final management and manufacture of this highly promising but then somewhat tough and refractory material displayed itself to the eye of the general public in the shape merely of neater square cuts in the place of the old bottle slices, but still with the sole purpose of rubbing out pencil-marks. It was but natural, under such circumstances, that this singular substance should acquire the name of "rubber," which it still retains, although from no want of specific names of its own, such as the "hevee" of Esmeraldas, the "siringa" of Guiana, and the "caoutchouc" of the Mainas, with which last rather repulsive choker of a name it has been somewhat unavailingly baptised, notwithstanding the possession of more euphonious cognomens, both in America and in India, such as jintarvan, saikwah, doll, and others besides either hevee or siringa.

Rubber, as we shall continue to call it (and for so doing we have the authority and example of one who has himself been called "the father of the India-rubber manufacture," namely, Mr. Thomas Hancock, of the firm of Macintosh and Co.), is an inspissation of the creamy juice of more than one species of tree; and, as already hinted, is found rather plentifully in parts of the tropical world widely asunder. There are even vines which yield a similar juice. In the estuary of the Amazon, on most of the great cluster of islands there, it is obtained in large quantities, and the mode of procuring it on these islands is thus described in a recent work on South America: "The season for the labour is from July to January, for the river is then low, and at other times the water is so high as to overflow all the low lands, where the India-rubber tree grows, so that the process cannot then be carried on. The tree is tall and straight, with a smooth bark, and sometimes grows to the diameter of 18 inches and even more. In order to collect the juice a longitudinal gash is made in the tree with a hatchet or tomahawk, and a wedge of wood being inserted, to keep the incision open, a small cup of clay is stuck to the tree just below it. These incisions are made all round the tree, and the little cups form a circle round the trunk. In these cups the juice, of the colour of milk, continues to run four or five hours, and each cup is found to contain from three to five table-spoonfuls."

India-rubber came first into special notice about the beginning of last century, moulded into the bottle shapes already referred to, and even into those of animals. It was sold as high as a guinea an ounce; but scarcely anything was known as to its history or origin at that time, except that it then came from America (as well as probably inland, then and previously, from India), till De la Condamine sent an account of it to the French Academy in 1736, describing it as the inspissated juice of a tree, and called by the natives "hevee." It is now known that the best kinds of rubber-bearing plants in the West and East are the *siphonia elastica* of the Amazon, the *hancornia speciosa* of Pernambuco, and the *urceola elastica* of Borneo, Pulo-Penang, and other East-Indian islands. The cultivation of these or other sources of this most useful, and, indeed, now almost indispensable, article has become a question of anxious consideration and of great importance. In America the destruction of the rubber-trees is prohibited by law, a practice having once prevailed of strangulating and killing them while withdrawing the sap. In some of the East-Indian localities where they abound, also, care is doubtless taken of the trees; but in other districts it is but too likely that the well-known fate of many of the gutta-percha trees may have been shared by the india-rubber yielders. It may turn out, as we have ere now suggested, that organic chemists may discover how to make an artificial rubber from some inexhaustible source, since a substance very similar *has* been produced in experimental chemistry, from bitumen, and, if we remember rightly, sulphur, in the acid form; but, till so fortunate a discovery *be* made, there cannot be too much care and trouble taken in the preservation and cultivation of the rubber-trees.

The importation of the milky or creamy juice of the rubber-tree was at one time regarded as a great desideratum. Some of it was imported by Mr. Hancock, but he found that before it reached this country the solid and fluid portions had separated, so as to frustrate the intention in view. As, moreover, the solid part, or the congealed rubber, formed less than fifty per cent. of the whole bulk, it was at length looked upon as a hopeless task to import the juice. Compensatory processes afterwards rendered this failure of less importance, perhaps, than it once was; but still it would seem, from a scientific examination, by Dr. Faraday, of the properties of some juice which *was* safely imported (in the hollows of bamboo canes, if we mistake not), more than thirty years since, that great advantages *would* accrue from having the opportunity of dealing with the raw material in the shape of the creamy juice; and in these, our own, days of daring and cosmical schemes and speculations, it is surprising that no enterprising India-rubber manufacturer has gone to the fountain head, by establishing the requisite works in convenient vicinity to the native tree-milking process itself, either in South America or in the East Indies. In confirmation of the idea that manufactures, of the beauty and purity of which we have as yet little conception, might be realized, were we only able to act freely and by wholesale on the raw juice, as it flows from the tree, we shall just dip a little into Faraday's report on the juice which he examined.

One most important feature was the facility with which the rubber-juice and rubber could thus be washed with mere water, over and over again, till both rubber and water were left perfectly pure. In this condition the creamy juice became "perfectly white," and portions of it so continued even for a twelvemonth, the sap being thus more easily preserved in a diluted than a concentrated state. When evaporated, either on paper, or on a capsule or otherwise, the rubber was left in its elastic state, and perfectly unaltered, except as regarded purity. On absorbent surfaces such as plaster of Paris the water was rapidly abstracted, and the rubber congealed into a mass retaining the form on which it was cast, and beautiful medallions were thus made. At first the rubber congealed as "a soft white solid, almost like curd." From this the residual water could be partly extracted by mere pressure, when it contracted, became compact, and assumed the elastic state, though still soft, white, and opaque. The opacity was not an essential property, however, being attributable to water not yet exuded. Exposure to air completely desiccated it, and then it appeared "as a perfectly transparent, colourless, and elastic body," except in thick masses, when a trace of colour (that is, of white opacity) still remained.

"No appearance of texture," continues the report,* "can be observed in the pure transparent caoutchouc: it resembles exactly a piece of clear strong jelly. All the phenomena dependant on its elasticity, which are known to belong to common caoutchouc, are well exhibited by it. When very much extended, it assumes a beautiful pearly or fibrous appearance, probably belonging to the effects which Dr. Brewster has observed elastic bodies to produce when in a state of tension upon light. When it has been extended and doubled several times, until farther extension in the same direction is difficult, it is found to possess very great strength."

In trials made to give it colour, the body colours were found to answer best.

"Indigo, cinnabar, chrome-yellow, carmine, lake, &c. were rubbed very fine with water, then mixed well with the pure caoutchouc, in a somewhat diluted state, and coagulation induced either upon an absorbent surface or otherwise. Perfectly coloured specimens were thus obtained."

A very instructive and interesting volume of personal experiences, difficulties, and discoveries, in the management and manufacture of rubber, has recently been written by Mr. Hancock, whose name is so intimately associated with the origin and progress of this manufacture.† The author, who is now upwards of seventy years of age, and appears to have survived all his original partners and compeers, has been engaged for the last six-and-thirty years in the manufacture of India-rubber. He attributes his success in this branch of manufacture mainly to a practical knowledge of mechanical manipulation which he had acquired in early life, and he thinks that this, much rather than chemical knowledge, was what was required in the circumstances: indeed, the peculiar difficulties which he had to overcome, and the result, on the whole, both of chemical and mechanical manipulation, as applied to rubber, seem to corroborate Mr. Hancock in this opinion. Of chemical knowledge he says he had almost none; and it is probable that, had he had *more*, those curious and unlikely mechanical operations by means of which the rubber was made to assume so many shapes, and particularly the mechanical process of "mastication," or "chawing up," into integral masses, would never have been discovered at all. At first, however, he *was* imbued with the notion that to make it useful, a good solvent was what was wanted, and he fortunately, but almost unaccountably, failed in then obtaining such a solvent, although he used oil of turpentine, which, when pure, and heated, *is* a good solvent, and dries perfectly off it.

First of all, the original "bottles" were merely cut up into various elastic strings, or tapes, and other forms, adaptable to wearing apparel, such as the backs of gloves, to draw these together, so as to cause them to fit neatly. In course of time, the waste became a matter for serious consideration; and, failing the discovery of an adequate solvent, various modes of procedure were adopted in the attempt to "work it up." Papin's digester only yielded him "a thick fluid of the appearance of treacle," doubtless containing the since-discovered solvent, named caoutchoucine, which is obtained in the *distillation* of rubber itself. Newly cut

* *Quarterly Journal of Science and the Arts:* "Royal Institution of Great Britain." Vol. xxi. No. 41. London: J. Murray. 1826.

† "Personal Narrative of the Origin and Progress of the Caoutchouc or India-rubber Manufacture in England." By Thomas Hancock, of the firm of Charles Macintosh and Co. London and Manchester; with engravings;—to which is added, some account of the plants from which Caoutchouc is obtained, its chemical analysis, statistical tables, &c.;—with an Appendix, containing the specifications of the author's patents. London: Longman and Co. 1857.

pieces, it was soon found, would unite, but the great source of perplexity was the outside cuttings of the irregular and small bottle forms. Small squares were punched out of the waste, however, and put together under severe pressure in boiling water, and thus solid blocks got, whence thin sheets could be cut with proper knives, supplied with water, which Mr. Handcock had soon found to be an indispensable adjunct in cutting the rubber. Still, however, the outside waste cuttings remained to be dealt with. It occurred to the indefatigable experimenter that were he to make mince-meat of these cuttings, the fresh cut or torn surfaces would be greatly multiplied, and he invented a mincing-machine, not unlike the recent invention whereby legs of beef are minced for sausages, in order to test the utility of his idea. The result was a very odd one: instead of thus being enabled to tear the waste cuttings into still smaller pieces, he was astonished, on looking for the shreds, to find that not a vestige of a shred remained in the mincing-machine,—nothing, in short, but a single solid ball of rubber! This was even more than he had stipulated for or anticipated: he found that the ball when cut open presented a marbled or grained appearance, exhibiting the shreds curiously joined together, and the union almost complete. The ball was wisely put in again to see what the machine meant to do with it. The result was that the ball became very hot, and on cutting it open at length, all the graining had disappeared, and the whole had become a solid homogeneous integral mass, which Mr. Hancock soon found out how to pass under rollers while hot, and so to convert into sheets and other handy shapes. He ultimately had constructed a more complete and perfect monster "masticating machine," or "pickle," as it was slyly called, which converted the whole bottle-rubber into solid cylinders, which ultimately contained 180 to 200 pounds weight of rubber each, to be "squelched" into square blocks 6 feet long and 6 or 7 inches thick, whence beautiful sheets were cut, sometimes not more than the eightieth part of an inch in thickness.

While the "masticator" was thus being brought to maturity, various other improvements in the manufacture, and numerous adaptations of the material to new purposes, and patents thereanent, were simultaneously in progress; but the grandest discovery of all was the vulcanization of the rubber. This, however, Mr. Hancock would appear to admit, was not made first of all by him, although, acting on a hint originally got in the shape of a few bits of evidently vulcanized rubber brought from America, he set to work, under the idea that sulphur seemed to be somehow used in its preparation, and at length, after a long course of experiments, found out for himself how to "vulcanize" the rubber, so as to render it independent, in its elasticity, to a great degree, both of cold and heat. The vulcanization of rubber is a curious subject, inasmuch as chemists are of opinion that the unchanging elasticity thus produced does *not* arise from any permanent combination of the sulphur used with the rubber itself, but from an allotropic change in the molecules of the rubber alone. When hard and horny rubber is thus made, however, by additional doses of sulphur, there doubtless must be a specific combination of the sulphur with the rubber. Mr. Hancock found that when rubber is blended with melted sulphur, the absorption of the sulphur takes place at about 240 deg. and then, by raising the temperature to 270 deg. or 280 deg. and allowing the rubber to remain in it for about an hour, it becomes "vulcanized." This, he says, is certainly the most simple mode of producing "the change," as he calls it, and also as effectual as any. There are other processes analagous to this of vulcanization, and called galvanization, mineralization, metallization, thionization, &c. by all of which the process of vulcanization is said to be meant, and in all of which sulphur, in one form or another, is said to be used. One of the best of these other processes appears to be that of Mr. A. Parkes, patented in 1846 (Mr. Hancock's discovery was patented in 1843). This the patentee called "converted rubber."

"The process," says Mr. Hancock, "is an elegant and simple one, and consists in immersing the rubber in a solution of the chloride of sulphur in bisulphurate (bisulphuret?) of carbon, or pure coal naphtha, cold, no heat being required: a thin sheet of rubber is by this means 'converted' in a minute or two * * * * the process is capable also of producing the horny state, similar to hard vulcanizing. The results of this process are as mysterious as those of vulcanization: they could not have been anticipated: they cannot be accounted for. * * * * The process of Mr. Parkes, enables us to give to vulcanized articles colour of every tint, and a delicately smooth surface: these converted surfaces also print well, and the most delicate impressions from copper-plate engravings are produced from them: gutta percha, and compounds of this substance with rubber, are equally susceptible of improvements in the same way."

The hard vulcanized rubber Mr. Hancock seems to have produced as well as the soft; but the former, if we mistake not, is exclusively the patent of Mr. Goodyear, who is the American Hancock, if we may so speak, and has also done an immense deal for the rubber manufacture, both in soft and in hard material. We are somewhat inclined, however, to agree with Mr. Hancock, in thinking that too much use may be made of a restricted material like India-rubber, in a form such as that of hard or horny vulcanite, in which its peculiar and invaluable property of elasticity is disguised or rendered useless, and even its impermeability is made of no avail. There are plenty of other materials, of a non-elastic nature, which will come to be substituted for hard vulcanite, should rubber become scarcer or dearer; and it is, perhaps, a question whether the innumerable products into which hard vulcanite is already being converted be not even now enhancing the price of the elastic and impermeable products of the rubber manufacture. Besides, hard vulcanite is really not so well adapted as other and cheaper materials are, at least, for some purposes: hair combs, for instance, made of vulcanite, are by no means so pleasant or effectual in use as the old horn ones, and are sometimes, we know, cast aside on that account.

It will easily be imagined that the introduction of so new and useful a material as vulcanized rubber would soon attract the attention of the ingenious and inventive. Without consideration of what has been done in patents of applications since the Great Exhibition of 1851, Mr. Hancock mentions that there had then been upwards of fifty patents taken out by various persons, who had adapted and applied it to their various purposes. To enumerate these, or even a selection of these, and of the innumerable other purposes to which India-rubber has been devoted from first to last, is here out of the question, more especially since it would seem that almost everything but good tender legs of mutton have been, are being, and will yet be, made of this protean material. We have sometimes even ruminated on the possibility of superseding the silkworms by the production of artificial silk from purified rubber in combination with something that would *take away* its peculiar elasticity while retaining its powerful tenacity and perhaps contributing the silky varnish. This idea suggested itself, we remember, upon one occasion while experimenting with India-rubber solution and asphalte, or resin, for the production of an impermeable coating for damp walls. The *stringiness* of the composition while laying it on the wall with a brush was such as forcibly to suggest the idea of silk being so produceable by wholesale, the resin being substituted, perhaps, by gum lac, or it might be also with some albuminous ingredient. Not being very likely to appropriate an idea which has been floating in our brain for some years without the realization of even a single experiment towards the end in view, we hereby make a present of it to others who may be less pre-occupied. We would recommend the use of chloroform as the solvent (should any other solvent besides heat and some fluxible resinous ingredient be found requisite, along with sulphur), from the exceedingly rapid evaporation of chloroform being likely to enable the experimenter to obtain the stringy floss in a dried state, especially if it were produced in the midst of an atmosphere of steam.

In offering these incidental suggestions, it will not be imagined that we claim the suggestion of producing thread from India-rubber. One of the most delicate and beautiful products already realized in India-rubber (as the medal of 1851 will testify) is the thread of Messrs. Nickels and Co. the first patentees and manufacturers in this country of India-rubber thread for braiding and weaving processes, elastic tissues, cords, belts, and other such articles. The idea of producing an artificial silk, either in floss for spinning into thread, or at once into thread itself, in the way suggested, is a totally different thing, and, besides, is as yet a mere idea, requiring, no doubt, an immensity of hard work, and no little cash, to realise it as fully as the thread of India-rubber "*pur et simple*" has already been.

But our suggestion has led us somewhat astray from the subject in hand, which is Mr. Hancock and his very instructive volume: it has also helped, moreover, to exhaust our space for that subject; but we cannot take leave of this author without recommending his narrative, to our younger readers especially, as one which strongly illustrates the immense advantages of *perseverance*, and a stout and unquenchable faith and enthusiasm while labouring through difficulties and disappointments suffered in a reasonable and useful as well as a still hopeful cause.

ROME.

WRAPPED in the mists of a legendary birth,—veiled in an atmosphere of mythical uncertainty,—alike the wonder of the unlearned, the undying theme of scholarship, and the delight of mankind in general, is the origin of that city whose name, once the synonyme for the world's dominion, by a just retribution now constitutes its moral and its lesson;—that city, whose history forms the connecting link between times past and present; and which, though so fallen from its once high estate, still presents in the ruins of its grandeur a shrine for the world's pilgrimage, to which an endless stream of votaries resorts to linger fondly on each spot hallowed by the presence of its statesmen and its warriors,—to restore in thought its palaces and its temples,—to trace its topography from its infancy to its fall, and to draw poetic inspiration from the scenes of its greatest desolation. Seen through the dim obscurity of a remote antiquity, its heroes and their achievements assume gigantic and distorted forms, or fade in utter indistinctness from the view; and where the light of truth seems to penetrate the general darkness, and point to bright spots on which the eye of inquiry may love to dwell, even there the many-coloured mantle of poetry invests the objects that it envelopes with tints of such exaggerated brilliancy, as to confound the calm conclusions of sober judgment.

"In no history is it later before we reach what is actually certain;" so said Niebuhr, who, following in the footsteps of Perizonius, Bayle, and Beaufort, gave that blow to the indiscriminating faith of ages which has proved the prelude to a sounder and juster comprehension of old theories, once so implicitly trusted, but now so suspiciously regarded.

But though the erudition and ingenious solutions of Niebuhr have roused the spirit of inquiry so long dormant, and doubtless paved the way for the better appreciation of Roman legends, and better writing of Roman history, yet his successors are by no means bound to subscribe to his conclusions.

The general untruthfulness of the old Roman legendary tales, was even more apparent to the writers of the Augustan age than to the moderns, who, seduced by a burning zeal for the study of classical antiquities upon the revival of letters, delighted in giving, at least, the semblance of an implicit belief to any absurdity, if only handed down to them through the medium of a classical language. Cicero and Livy were mistrustful of their authorities, but treated them with the respect they paid to an equally doubtful mythology.

In the eleven books now extant of the twenty written by Dionysius of Halicarnassus, and in the thirty-five remaining of the 140 of Livy, we find our only detailed account of the first ages of Rome. Living in the Augustan age, they of necessity wrote from the information of earlier writers, and in the first ten books of his work Livy quotes from Fabius Pictor, Calpur-

mius Piso, Claudius, Cincius, and Valerius Antias, all of whom were more or less infected with exaggeration and partiality. Of these, Fabius Pictor, considered to be the most ancient Roman historian,—*Scriptorum antiquissimus*,—was noted by Polybius for his partiality; and Valerius Antias, frequently referred to by Livy, is termed by that author the most lying of all the annalists. Plutarch, in his lives of Romulus, Numa, Publicola, Coriolanus, &c. describes particular periods, and incidental mention of various historical facts occurs in Polybius and Cicero. The other prose writers lived at much later periods, or, being poets, sacrificed truth to effect. To connect the broken chain of a narrative thus gathered piecemeal, monumental inscriptions and public and private records would doubtless supply many a wanting link; but incorrect transcriptions of the first, and the notorious falsifications that family vanity introduced into the last, would sadly deteriorate their value.

The wooden tablets upon which the *Pontifex Maximus* annually inscribed the leading events of each year, thence called the *Annales Maximi*, and which had been continued down to the time of Mutius, were destroyed by fire at the invasion of the Gauls. The *Leges Regiæ* were saved; also many of the treaties of peace and the *Libri Lintei* (on linen), preserved in the temple of Juno Moneta, also escaped destruction. These, with the journals of the Censors, corrupt family memoirs, funeral orations—panegyrics, by which Cicero says history had been completely falsified, old heroic ballads, upon which Ennius built his *Annales*,—and the like, made up the chief sources of information when Fabius Pictor wrote:—traditional legacies "ad ostentationem scenæ gaudentis miraculis aptiora, quam ad fidem."

Next in antiquity to Fabius Pictor was Cato the Censor, to whom a large portion of what has come down to us is due. Of his great work, the "*Origines*," the second and third volumes of which contained the origin of the Italian towns, but fragments remain. When Cato wrote, the Etruscans, Oscians, and Sabellians still existed as nations, and their *fasti* and chronological registers might have been consulted, which must have given great value to his work when extant.

"What moved Livy to write," says Niebuhr, "was that nature had endowed him with a brilliant talent for delineation of character, and for narration, with the imagination of a poet, but without either the power or love of versifying. He wrote without positive feeling, whether of doubt or conviction, bringing down the marvels of the heroic ages into the sphere of history," &c. His sole wish was to elevate his countrymen, even to the perversion of facts, and whilst borrowing largely from Polybius, distorted his plain truths without acknowledging the source whence he drew them. Allowing, nevertheless, for all defects in exaggeration and over colouring, he produced a colossal masterpiece unequalled by the Greeks; and we may agree with Niebuhr, that "of all the losses which have befallen us in Roman literature, the greatest is that which has left his history imperfect."

Polybius was an author of a different kind. Living at a much earlier period, he was not only more conversant with the subjects that he treated of, but studied deeply and described the events of his own period only, and when incidentally and briefly he speaks of remote ages, he proves that early traditions were less corrupted when he wrote than when Dionysius and Livy improved upon them.

Had Cicero written an early history of his country, the discriminating talent of such a man would have been of signal service to the world in weighing conflicting accounts, and the highest respect would have been paid to his opinions, but as it is, he merely quotes facts to illustrate arguments.

Of the historical compendium of Paterculus, written about A.D. 30, the first part, commencing apparently with the siege of Troy, is missing; and the single manuscript that has come down to us abounds so with errors, that his text is much corrupted, but his relations of character exhibit discrimination and judgment.

Florus divides the history of Rome, up to his own time (Adrian), into four periods: first, its infancy under its kings, struggling for very life round the mother city; second, its youth, from Brutus and Collatinus to Appius Claudius and Quintus Fulvius; third, its manhood, up to Cæsar Augustus, during which period it subdued the world; fourth, its old age and decrepitude, experiencing, however, a transient return of pristine vigour under Trajan.

The epitome of Florus abounds in the prevailing corruption of Roman history, being turgid, florid, and panegyric rather than faithful.

The chief work of Servius is an elaborate commentary upon Virgil. This work is still extant, though much interpolated by different authors, as shown by the great differences existing in the different manuscripts that have preserved it to us. Even in its present condition, however, it is regarded as one of the most important and valuable of all the Latin scholia.

Of the Abridgment by Festus of the work of Verrius, *De Verborum Significatione*, one imperfect manuscript only has come down to us, the numerous blanks in which have been ingeniously filled up by Scaliger and Ursinus. It contains a rich treasure of learning upon many points connected with antiquities, mythology, and grammar. He was supposed to have lived in the fourth century of our era.

One of the most voluminous of Roman authors was Varro, *Romanorum doctissimus*, famed for his vast and varied erudition, but of whose 490 books two only have come down to us, and one of them in a mutilated form. His work upon agriculture ranks him first among the *Scriptores Rei Rusticæ veteres Latini*. In the remains of his treatise, "De Lingua Latina," we find much curious information connected with the ancient usages of the Romans. His great work, upon which his reputation for profound learning was based, was his "Antiquitates;" but we possess but a few fragments of it; but, says Niebuhr, the loss of Varro's writings are not of much importance, his statements concerning the early history of Italy being for the most part worthless, if we except the list of the cities of the aborigines.

Such were the principal sources from which early Roman history has assumed the uncertain forms in which it appears to us after the lapse of nearly 3,000 years; but the principal traditions of which resolve themselves into three leading varieties, namely, that the foundation of Rome preceded the Trojan War; or that its foundation by Æneas immediately succeeded that event; or that it was founded by Romulus several centuries after the Trojan War. The speculations as to the origin of the name of *Italia*, originally confined to the southernmost part of Bruttium, being derived from the numerous oxen (ἰταλοι) which the district produced, would seem to be sufficiently unprofitable, when so much more likely an origin is found in the land of the *Itali*, so called after Italus, a law-giver of the Œnotrians, which people, according to Greek accounts, were Italians, and under which name, in its more extended sense, all the tribes of the same race, Tyrrhenians, Siculians, and Latins were included. Dwelling in the earliest times to the north and south of Latium, were the Umbrians and Oscans; the former possessing all Lombardy and Tuscany, the latter known under various names, as Volscians, Ausones, Aruncans, &c. The languages of these two nations, according to Lepsius, pervaded Italy, and were allied to each other by sensible affinities. A third and most important element was added to these in the Helenes, Pelasgi, and Etrusci.

Cumæ was considered to be the earliest Greek colony in Campania. Numerous other Greek colonies were formed, and, indeed, South Etruria exhibits Greek influences throughout its extent.

The emigration of the Œnotrians, or Pelasgi, dates back from a most remote period. They were also called Aborigines and Siculi, who, as we have already seen, were the same as the Itali or Vitali. The spread of the Pelasgi seems to have been as extended as that of the Celts in later times; and to their language—different to that of the Helenes, but having affinity to it—is to be attributed the existence of that Greek element in the Latin tongue, unquestionably referable to its influence.

By learned quotations, says Professor Newman, it is satisfactorily demonstrated that the Ionians and Æolians were Pelasgian; that the Selli, or Helli, were Pelasgian; that the Helli were Helenes; and Helenes, Dorians: therefore we may presume the Dorians were Pelasgian: moreover, Thessalians and Siculians, Œnotrians and Latins, were all Pelasgian. "All we know of them" says the same writer, "is, that they were closely akin to the Trojans; and while rejecting all the rest of Niebuhr's speculations, we may accept his conjecture that the migrations of the Pelasgians by sea from the coast of Troas to Sicily and Italy, carrying with them their *Penates* and worship, generated the poetic legends concerning Æneas and others."

The well-known habit of the Roman poets in calling the Greeks indiscriminately Pelasgi, doubtless much influenced the world in confounding the two races together. The Etruscans were a third people, foreign in Italy, called by the Romans Etrusci, or Tusci; by the Greeks, Tyrrheni, or Tyrseni; and by themselves, Rasena.

The country between the Tibur and the Mare Inferum, or Tyrrhenian Sea, and bounded on the north and north-west by the Apennines and the river Macra, was their seat. Their early history has given rise to much discussion in modern times, and it is now admitted on all sides that the people known to the Romans as Etruscans, were not the original inhabitants of the country, but a mixed race. The most ancient inhabitants appear to have been Ligurians on the north, and Siculians on the south, both of whom were subsequently expelled by the Umbrians. From this point two opinions have prevailed. The first (that of Herodotus) ascribes them to a colony of Lydians under Tyrsenus, son of the King of Lydia, from whom they took their name, and in this opinion Cicero, Strabo, Paterculus, Seneca, Pliny, Plutarch, and Servius follow; the second is, that a Pelasgic race, called Tyrrheni, subdued the Umbrians, and settled in the country, who were afterwards in their turn conquered by a powerful Rhætian race, called Rasena, who descended from the Alps and the valley of the Po. Hence it was from the union of the Tyrrheni-Pelasgians and the Rasena that the Etruscan nation was formed. Dion of Halicarnassus considers them aborigines, but admits that a tribe of Pelasgi passed from Thessaly into the heart of Italy prior to the Trojan war, who assisted the aborigines in their war with the Siculi, whom they forced to fly to Sicily, the seat of the ancient Sicani. Gibbon agrees with Dion. Gorius derives the Etruscan element from Egypt or Phœnicia, which he considers the original seats of the Pelasgi; thence driven out into Achaia, Thrace, Arcadia, &c.; and from thence passing into Italy. Mazzochi follows the Oriental theory. Maffei brings them from Canaan, and Guarnacci derives them from the East after the Flood or Babel, asserting that the Umbri and aborigines were the same people; that they spread over Italy, and some tribes of them, called Pelasgi, thence emigrated to Greece, &c. Being entirely ignorant of their language, it is impossible to arrive at a definite knowledge of their origin, but we know them to have been a very powerful nation when Rome was still in its infancy, having extended their dominion over a great part of Italy. Through the attacks of the Gauls in the north, and of the Sabines, Samnites, and Greeks in the south, they became confined at last to the limits of Etruria Proper, and long flourished there after they had disappeared from the rest of Italy. Of the twelve cities that formed the confederation, no list is given by the ancients, but they were probably Cortona, Arretium, Clusium, Perusia, Volaterræ, Vetulonia, Rusellæ, Volscinii, Tarquinii, Valerii, Veii, and Cære, more anciently Agylla. The latter part of the history of Etruria is a struggle against the growing power of Rome, into which nation it in time became absorbed.

The name *Italia*, from its early signification of the southernmost part of Bruttium only, at last, about the time of Polybius, included in its widest extent the whole country from the Macra and Rubicon to the Straits of Sicily, the country thence to the foot of the Alps being called Gallia Cisalpina. Italia and Œnotria, Ausonia

or Opica, Tyrrhenia, Iapygia, Ombrica, Hesperia, Camesne, Argessa, and Saturnia, are poetical names derived from the Greek names of the tribes inhabiting the peninsula, in the flourishing times of Magna Græcia.

Dionysius states, that Latium was inhabited at the earliest times by the Siculi, a portion of whom were forced to give way to the Prisci or Sacrani, an aboriginal people, who had been forced from their seats by the Sabines, and who, uniting with the Siculi, who still remained, formed together the *Prisci Latini*, or *Prisci et Latini*, or simply *Latini*. Thus, the population of Latium was a mixed one, consisting, on the one hand, of Siculians, aborigines, and Oscans, all of whom belonged to the Pelasgian race; and on the other of Sabellians. The Siculians had spread along the east coast of Italy, from north to south, one branch of them only having crossed the Apennines, the progenitors of the future Latins. In proof of this relationship, a similarity in the sense of words, between the portion driven into Sicily and the Latins themselves, has tended to the conclusion that their whole language was fundamentally the same, although that of Latium was destined to receive further changes from new immigrants; for, according to Dionysius, they were afterwards conquered by another people from the Apennines.

The Latin language is allowed to be one of the Indo-European group, to which German, Greek, Welsh, and Irish belong; and prevailing opinion assigns to the latter a more remote position than to the others; and the composition of Latin from Siculian, Umbrian, Osean, Greek, and Sabine, and perhaps Pelasgian and Etruscan elements, adds to the embarrassment. But we may conclude, that one of the compound dialects that make up the Latin language, may fairly be termed Celtic. Among the arts of Latium, was a system of massive fortification. Prænestе and Tusculum, Ferentinum and Alatrium, Norba, Cora, Signia, Arpinum, and many other places, attest the mode of massive but rude construction, ascribed to Pelasgic origin, though the mere fact of its Cyclopic style does not always establish its claim to a remote age; Signia, for instance, having been planted by Tarquin, and its Cyclopic walls, therefore, to be imputed to him.

The Romans, upon the subjugation of Etruria and Latium, adopted many of their rustic deities as well as their local customs and superstitions: Saturn, Janus, Faunus, and Picus were Italian gods. The natural phenomena of Italy gave rise to numerous local deities: "Nullus lucus sine fonte, nullus fons non sacer propter attributos illis deos qui fontibus præesse dicuntur." The mythology of Etruria was more pure than that of Greece, but its fables were not so ingenious. "When the Romans were allured by the arts of Greece, the rude and simple traditions of Italian mythology yielded to the enticing and voluptuous fictions of a more polished people. The spirit of polytheism did not restrict the number of gods, and the ministers of superstition seemed always ready to reconcile the most discordant systems." Thus the Greek Kronos became identified with Saturn; the Etrurian Faunus became confounded with the Arcadian Pan, and Fauns and Satyrs indiscriminately commingled.

Respecting the foundation of Rome, one tradition, very prevalent, ascribes that event to Evander, about sixty years before the Trojan war. Evander is supposed about that period to have led a Pelasgian colony from Pallantium, in Arcadia, into Italy, and there to have built a town called Palatium, at the foot of the Palatine-hill, which was afterwards incorporated with Rome. The appellation of this town is by others derived from Pallas, grandson of Evander, by his daughter Launa and Hercules.

Of the deep faith reposed in this tradition, proof is shown in the divine honours to a late period paid to Evander and his mother, Carmenta. In addition to this, both Livy and Tacitus ascribe the introduction of letters and civilization to Evander,—an opinion very prevalent with the Romans. The second tradition, and one very prevalent amongst the Greeks, regards Æneas, or one of his immediate successors, as the founder of Rome. We need not recapitulate the story of Æneas and his Trojans, as told by Livy and Dionysius, and adopted by Virgil, with all the embellishments of poetry. Cephalon, who lived about 350 years after the building of Rome, seems to have been the first to introduce Æneas into Latium; but whilst the general tradition places several centuries between his arrival in Latium and the foundation of Rome, Cephalon calls one of his sons Romus, and ascribes to him the foundation of the city. There are other varieties of the same legend that we cannot here allude to. The third form of tradition, which ascribes the foundation of Rome to Romulus, was that most universally believed by the Romans.

This version of that important event, as recorded by Fabius Pictor, and adopted by other ancient historians, may be regarded as the great national tradition of Rome, and there can be but little doubt that it was of native growth, as many of its incidents serve to explain Roman rites and institutions, such as the worship of Vesta, the Lupercalia, Larentalia, Lemuria, Fratres Arvales, &c. By this account, too, no violence is done to the received opinion of the connection of Æneas and his Trojans with the origin of the city, as its ancestral parentage is still connected with his name. The tradition is that he was succeeded in the government by his son, Ascanius or Iulus, who, thirty years after the foundation of Lavinium, founded the town of Alba Longa. The successors of Ascanius now reigned at Alba for 300 years; but upon the list of kings as given by Livy and Dionysius, but little reliance can be placed, having evidently been made up in later periods, to fill up the interval between Æneas and Romulus.

Possibly the last-named immigrants into Latium, as related by Dionysius, may have caused the distinction that existed between the *Prisci* Latini and the others, who, apparently, can only be the Latins that adhered to Alba Longa as their leading city. As many of the thirty townships inhabited by the Prisci Latini, called colonies of Alba, were older than Alba itself, we must infer that the *populi Albenses* were the colonies founded by Alba, and not the other and more important towns.

From these preliminary observations we see that long before the time assigned to the foundation of Rome, Latium was a flourishing country, containing numerous towns formed into a powerful confederacy. Of the three periods assigned to the foundation of Rome, the last, from its entire adoption by the Romans themselves, and the collateral evidence of circumstances, is the one alone worthy of attention; and although discrepancies exist as to the year of the event, still the main feature of the intervening period between Æneas and Romulus remains the same. And as we may have occasion frequently to refer to the admirable article upon Rome contained in the "Dictionary of Greek and Roman Geography,"* alluded to in our late papers on "Athens," we will adopt the summary of dates which the writer there gives us, and which, indeed, is strictly accurate. "The sum of the reigns here given (Dionysius and Diodorus), allowing five years for that of Æneas, who died seven years after the taking of Troy, is 432 years,—that is, down to the second year of Numitor, when Rome was founded by Romulus, in the first year of the seventh Olympiad. Now, this agrees very closely with Varro's era for the foundation of Rome, viz. 753 B.C. For Troy having been taken, according to the era of Eratosthenes, in 1184 B.C. the difference between 1184 and 753 leaves 431 years for the duration of the Alban kingdom. Varro's date for the foundation of Rome is that generally adopted. Other authorities place it rather later: Cato in 751 B.C.; Polybius in 750; Fabius Pictor in 747."

Another and a prevailing opinion among the Romans was that of assigning three centuries only to the Alban monarchy before the time of Romulus. Of this opinion was Virgil, where, in the prophetic promise of Jupiter to Venus, he says:—

> "Hic jam ter centum totos regnabitur annos
> Gente sub Hectorea; donec regina sacerdos
> Marte gravis geminam partu dabit Ilia prolem."

Thus have we briefly traced the leading features in the legendary and mythical history of the origin of this great people, whose moral influence in the ruins of their grandeur still binds mankind by as potent a spell as when by their martial might they swayed the sceptre of universally acknowledged supremacy.

We must defer the consideration of Rome itself to a future number.

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MR. SYDNEY SMIRKE'S SECOND LECTURE ON ARCHITECTURE AT THE ROYAL ACADEMY.*

In my last lecture I addressed to you some general remarks on the position of our art, and on its leading principles.

I should have been glad in the present lecture to have descended into details, and to have considered with you the practical application of these principles; but such a duty could not be satisfactorily fulfilled without many diagrams, I therefore postpone that task to a future opportunity. I think that I cannot employ the present occasion more usefully than by tracing the course of our art, through its various phases, from the early practice of it down to late times. Besides the intrinsic interest of such a view, I think it essential to a right understanding of our position as artists that we should be well acquainted with the course that our art has run.

Nor is a knowledge of this history unworthy of the attention of the more general student. Our distinguished historian, Hallam, truly says, that "no chapter in the history of national manners would illustrate so well, if duly executed, the progress of social life, as that dedicated to domestic architecture." And as this social progress is intimately connected, if it be not identical, with civilized life, we may, by the same authority, regard the history of our art as illustrative of the progress of civilization itself. Even in countries respecting which we have the written traditions of their history, no material surviving evidence can be adduced as affording a stronger collateral confirmation of its truth than their architectural remains. The barbarity or refinement of a people,—their prosperity or decline,—the derivation of their races,—the extent and character of their commercial relations,—all these exercise so marked an influence on their architecture, that it would scarcely be an exaggeration to say of such a people that their history may be read in their buildings as plainly as in their books.

Let me, then, devote this evening to a cursory glance—for such only will our time permit—at the history of architecture. The rapidity of our survey must be such as to forbid our entering at all into antiquarian research; nor have we time to amuse ourselves with any endeavours to penetrate the obscurity of primæval times.

It is, indeed, curious to mark the traces of the early troglodyte, and to recognise in the cabin of the Indian or the kraal of the Hottentot a reflex of the primitive efforts of builders when the world was young, and art, in its higher sense, unborn. It is highly interesting thus to detect, as it were, the print of the naked footsteps of primæval man,—but such speculations are ill suited for the present occasion.

Nor, indeed, do I think it expedient for us to bestow more than a passing regard on the labours of the early builders even in those more advanced periods when men spread and settled over the teeming continent of Asia, had learnt the secret that architecture afforded a potent auxiliary in overawing and subduing the human mind, and making it amenable to the mysterious impressions of a religious consciousness.

It is beside my present purpose to inquire when, or at what point of the horizon, the rays of our art first dawned. Antiquaries give this honour to Egypt, but the dates of the antiquary are often based on far more precarious foundations than we, as builders, love to rely on: and I am happy in the belief that it forms no part of my duty to entangle you, or myself, in the abstruse deductions of the astronomer, nor in the elaborate science of those who would dive into the mysteries of hieroglyphics.

It is enough for me to say that any remote dates are assigned to many amorphous piles of decayed architecture on the plains watered by the Tigris and the Euphrates, and still more remote dates are confidently attributed to many less decayed piles of architecture scattered along the course of the Nile; whilst on the great promontory of India, also, exist many solemn monuments of man's handiwork that have been left by the retiring tide of civilization—often without a date or even a name to guide us with certainty as to their origin.

All these buildings, far apart as they are, no doubt differing widely in their dates—widely differing, certainly, in their physiognomy—all speak, as it were, one common language, telling us of men—in a rude state, it is true, but endowed with a deep sense of

* Read Monday evening, the 2nd inst.

grandeur in form, and not always without a strong sense of the beautiful,—especially delighting in works of a broad, robust, and masculine character; little acquainted with the graces of art—not at all with the finesse of construction, or with dynamical science.

It is certainly well worthy of observation how soon men perceived the capabilities of our art, and acquired the science of so piling up stones as to produce a powerful effect on men's minds. "Go to," said the rebellious descendants of Noah, exulting in their newly-acquired arts of construction; "let us build a city and a tower, the top of which shall reach unto heaven:" and from that day to the present time, throughout the world, one of the chief exponents of a country's pride, or its opulence, has been the greatness of its architecture.

I leave to the antiquary the consideration of the style and character of the buildings of these prehistoric times. But Egypt, the reputed cradle of the world's civilization, demands of me some short notice. However deficient the early architecture of this remarkable country may have been in that grace and elegance which were reserved for another people and a later period, it is yet certain that the art here acquired much of the character of a fine art; and I think we must admit that the Egyptian builders produced works marked by a dignity of conception which, in the lapse of 3,000 years has been scarcely exceeded. The earliest development of Egyptian art is found about the delta of the Nile, and its chronological progress is up that river, for the ruins about the cataracts are of later dates. It is natural, indeed, that those most accessible and most readily cultivated districts should be the first settled, and that there communities would be first founded. As population increased and cities multiplied, the human tide ran upwards towards the mountains. Abundant architectural remains attest this fact, and show that Egypt offers no exception to what I hold to be the rule, that our art affords a safe index of the progress of civilization.

The Egyptians, however, were not a progressive people; their civilization did not advance with time; and to this our art clearly testifies, for the era of the Shepherd Kings is marked by even nobler remains than those of the Ptolemaic period. To a hasty observer there is no wide difference in the style or aspect of their buildings during perhaps thirteen or fourteen centuries or more: a strange phenomenon this, when we reflect what extraordinary changes have been since effected in our art within a much shorter period, among races of a more active spirit.

But while the swarthy worshippers of Memnon were piling up their ponderous masses of granite and basalte, after the fashion of their remotest ancestors; while with more patience than genius unnumbered carvers were labouring over and polishing the surface of their colossal, yet still lifeless and conventional sculpture, a seed had been wafted to a more genial soil, and had struck root among the marble mountains of the Peloponnesus; an art was there born destined soon to give the law to all after time.

Peculiar mental endowments characterise nations as plainly as individuals: and special moral aptitudes seem to have their geographical limits almost as clearly defined as those which govern the vegetable world. The delicacy of taste which early distinguished the Doric race was a surprising phenomenon. A population very small, and apparently without much unity of origin, fostered by no favourable circumstances, scattered and broken up over a hundred islets and along rugged coasts, constantly contending for personal security against the indigenous races—these hardy warriors and intrepid seamen became, in two or three centuries, the most refined artists that the world has yet produced.

Yet these Greeks had not, in the arts at least, any very fruitfully inventive genius. To Egypt and Assyria may be traced much of the raw material of Greek art. Their wonderful power lay in the purifying, elevating, subtilising, and idealising art. They did not create the body, but they modified its members, and breathed into it a soul. They eminently possessed that alchemy, by which the base metal of their predecessors became in their hands a pure gold.

It was no long period of gestation which preceded the birth of true Greek architecture. In the eighth century before the Christian era, there is, I believe, no evidence of its having acquired any very high æsthetic character. The singular structures which have been transferred by Sir Charles Fellowes, from the coast of Lycia to the British Museum, give but a faint foreshadowing of the grace and beauty that were to follow; and the well-known gateway at Mycenæ savours more of Assyrian than of Grecian design. Yet as early as 600 years before Christ, a noble Doric temple was erected in Sicily, near the modern Solinunte, differing in no essential respects from that consummation of Greek art, the Parthenon itself, which arose in the middle of the fifth century.

Much diversity of opinion exists as to the moral dignity of the Greeks: some are disposed to regard them as little better than successful brigands; whilst others as little less than a race of demigods. It may be that undue proportions are imparted to the form of men dimly seen through the haze of remote antiquity, for "Distance lends enchantment to the view;" and possibly were it given us to know the truth, divested of fable and hyperbole, some of those whom we have learnt to look up to as godlike heroes might shrink into the dimensions of bold gladiators. All this, however, may be the case, and much of Grecian history itself may be mythic; but Grecian art stands forth as a palpable, appreciable fact. Their works are before us; and even now, after the lapse of more than 2,000 years, which of us will venture to deny that in architecture and sculpture no other men have since wrought as they wrought.

In the slight historical sketch which now engages us, any detailed consideration or analysis of style would be misplaced. For this, other more appropriate occasions may, I trust, present themselves. The course of events leads us on to the period when the wonderful light of Greek art began to wane. All that was of purest and highest quality was produced within the narrow limits of little more than a single century; namely, from about the middle of the fifth century before Christ to the death of Alexander.

The career of that conqueror made known to Greek artists many new and strange forms of art among the conquered races, and the love of novelty inherent in our nature would naturally lead to their adoption. Lord Aberdeen, many years since, pointed to the East as the probable source from whence the arch was derived which ultimately so materially influenced our art; and his lordship's supposition has found a remarkable confirmation in the recent discovery of the arch in Assyrian sculpture.

Up to the period last referred to, we are, I think, justified in assuming that the styles, or orders, taking their names severally from the Dorian and Ionian States, were exclusively used; but whether the merit of priority is due to the former, as Vitruvius avers, may admit of doubt. The rude but undeniable representation of Ionic columns, which occurs in the Assyrian sculpture now in the British Museum, must be at least as old as any known example of a Doric building.

The third order, the Corinthian, bears every mark of a later origin: its rich exuberance was the natural result of that maturity which preceded its decay. The date attributed to that union of grace and beauty, the Choragic monument of Lysicrates, at Athens, is 335 before the Christian era; and this is held to be the earliest authenticated example of the style: although it cannot be supposed that so perfect and symmetrical an order could have issued at once in all its maturity and perfection, like the goddess of Athenian idolatry, from the brain of even a Grecian artist. The gradual steps by which men of genius elaborated the elegant Corinthian capital from the lotus-shaped summit of the Egyptian columns are lost to us, it is true, but may be conceived and even traced in the imagination; and such a parentage seems far more natural than the one assigned to the order in the familiar story handed down to us by Vitruvius.

Whilst, however, the application of this order to temple architecture was certainly late, it is equally certain that its adoption was general and rapid. Within a century after the date of the small monument just named, the order had almost monopolized the attention and favour of architects.

It was long after its attainment of eminence and power, that Rome sought to augment its dignity by the cultivation of the fine arts.

To meet the ampler means and wants, but less fastidious taste, of the conquerors of Greece, architecture laboured not in vain.

Wonderful as was the progress of her arms, Rome may lay claim to almost an equal triumph in the arts. It was not, however, in a painful study of the refinements of art, nor by the generation of any striking novelties, that the Roman people sought to indulge their love of architecture. As they hesitated not to enlist men of all races and climates into the ranks of their armies, and even to adopt and naturalise the very divinities of their vanquished enemies,—so also were they nothing loath to avail themselves of the artists of other countries when they desired to adorn their own capitol; and the ready supply of cultivated artists which Greece was able to afford, though it must have tended to improve and elevate the tone of art in Rome, can hardly have tended to the practical encouragement or growth of a race of native artists. It seems to be generally admitted, even by their own writers, that the Roman genius was less successful in the cultivation of fine arts, and, notwithstanding the eagerness of opulent proprietors and public bodies for the possession and display of such monuments, that people never attained to the exquisite acumen of their teachers.

Yet over the whole Roman world, from the Thames to the Tigris, are scattered in profusion the evidences of their love of architectural splendour and luxury; and their temples and palaces, their theatres and villas, bear testimony to their all-pervading *political* power, as decisive and palpable as any that can be drawn from the written records of history.

In the reigns of the Antonines, Rome appears to have reached what in the language of geology would be called the anticlinal line of her grandeur. It is of this period that Gibbon speaks when he says, "If a man were called to fix the period in the history of the world during which the condition of the human race was the most happy and prosperous, he would, without hesitation, name that which elapsed from the death of Domitian to the accession of Commodus," and it is precisely to this period that we must refer the highest excellence of Roman architecture, and to which some of her finest examples may be attributed.

The Pantheon and Coliseum, however (although not quite of that date), are the two buildings which perhaps exercised the most direct and powerful influence on the architecture of all succeeding times: the former may be regarded as the parent of all the domes that have since been erected, whether in the east or the west, and the form in architecture which, in the opinion of many, may be said to possess, in a higher degree than any other, the attribute of sublimity.

In the latter, the Flavian amphitheatre, we recognise one of the earliest known examples of that wedded union of the arch and the column whence has descended such a fruitful progeny of grace and beauty.

The religious architecture of the Romans did not indeed very materially differ from that of their predecessors in Greece; but the last-mentioned colossal structure, widely differing from any known Grecian type, seems to have greatly influenced design in all subsequent civil architecture.

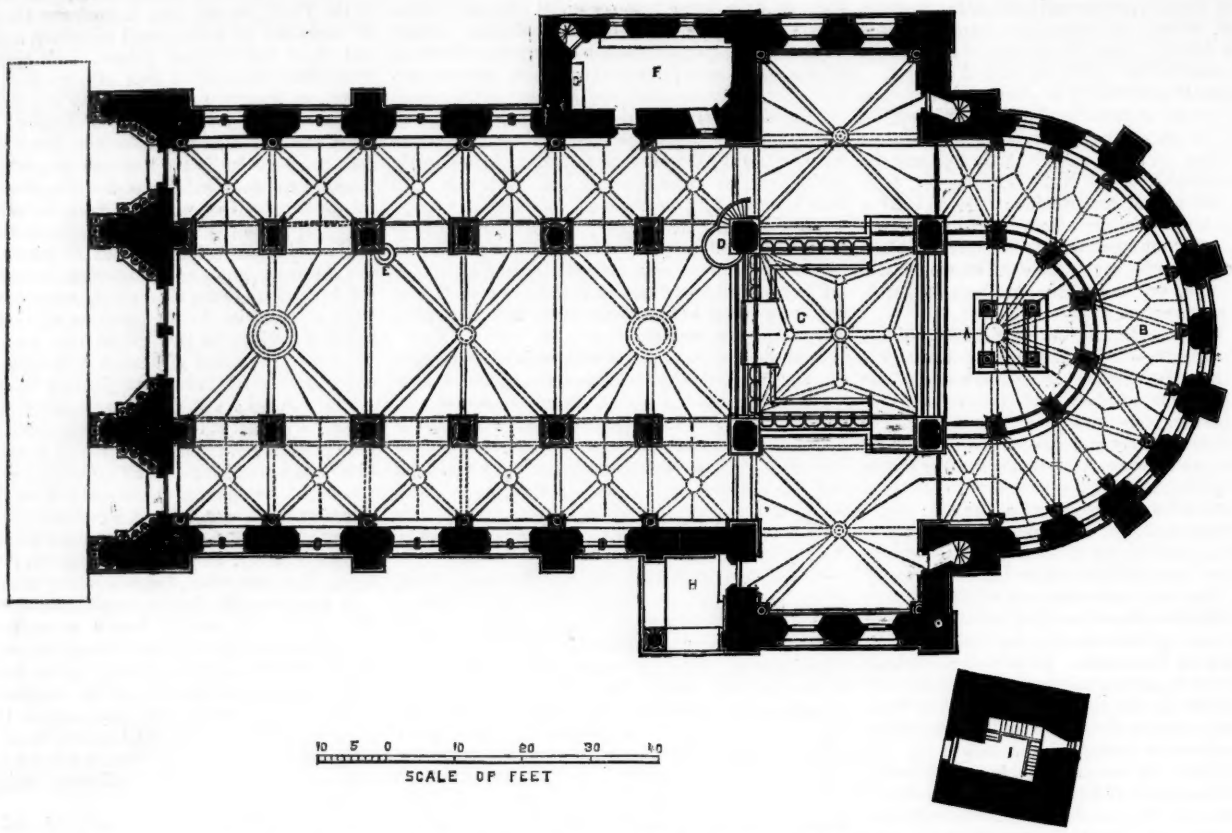
The idea of an arcade strengthened and relieved by columnar construction had perhaps long previously developed itself, as in that interesting ruin known as the Villa of Mecænas, at Tivoli, and elsewhere; but this vast amphitheatre, still the most conspicuous and popular ancient building in Rome, so well calculated to gratify at once the pride and the pleasure of the Roman citizens, perpetuated the idea; and the arrangement was not only repeated in succeeding amphitheatres, and scattered over the Roman world, but it struck deep root in the general practice of Roman architects, and has never ceased, down to our own times, materially to influence architectural design. The arcades, indeed, lost their breadth and grandeur as art declined, but some form of arcade was rarely afterwards omitted in any important composition.

It would be a curious, although perhaps a somewhat tedious task, to note the degradation of architecture step by step. True to the law that our art is an index to the state of civilization, as the Roman character degenerated, Roman art sank *pari passu*; and by the age of Diocletian, when the empire was merging towards its close, the days of classic architecture were numbered.

Its fate after the fall of the Roman empire is a subject that has of late engaged many pens. Till lately, indeed, only casual and superficial attention was paid to the subject of the state of art in its declension. But a very different feeling has since arisen, and writers who, a few years ago, would have deemed the topic hardly worthy of investigation, will now descant with laborious and reverential attention upon its minutest details.

Still the subject remains obscure, and authorities differ widely both as to the date and to the parentage of many notable monuments; and, although I again disclaim polemics, you will, perhaps, permit me to detain you a very few minutes in its consideration. Before the fall of the empire, the architecture of Rome maintained an undivided authority over every portion of that vast empire.

From Thule to the extreme south, an almost uniform style prevailed; varied, it is true, by provincial peculiarities and exigencies, yet essentially uniform. When, however, the ligatures, which bound together the imperial Colossus, became loosened, and the empire was dismembered, art also soon lost its unity, and a very different fate befel its eastern and its western extremities. In the east it fell into the hands of the descendants—sadly degenerated and corrupted, no doubt, yet still the descendants—of the greatest artists that had ever lived. In the west, it fell into the hands of invading hordes, ignorant, and for the most part regardless of art; yet affected, as we know, and even awed by the prestige of that great but fallen empire. Thus differently circumstanced, and separated both by geographical position and by national antipathies, eastern and western art soon began to wear very different aspects. In the east, Greek traditions infused into the architecture of Byzantium a character of its own, elegant and ornate, yet somewhat flat, and grave, and quiet. In the west, Roman art, in its decadence, was less metamor-



PLAN OF PROPOSED MEMORIAL CHURCH, CONSTANTINOPLE.

phosed, but exhibited strange departures of the Roman type, arising more from the ignorance and the rude impetuous energy of the age than from any new element of design; for nothing is more generally admitted than that those Huns and Ostrogoths, and even the Longobardi, brought with them but few art-traditions of their own. This western (or rather this north-western) phase of Roman architecture has been aptly named the Romanesque style, and probably existed nearly contemporaneously over a large portion of the western empire.

A distinction has been drawn between the Romanesque of Lombardy and that of the Rhine; but, notwithstanding the uncertainty that prevails in the dates of the earliest examples during this obscure period, I believe that, except those differences naturally arising out of the difference of climate, we possess no early evidence of any such marked distinction.

In those districts where examples of Roman architecture most abounded, as in the south of France, the Romanesque savoured most strongly of the classical type, for among the early converts to Christianity no unwillingness was felt to adopt the architecture of their Pagan predecessors. Some Christian emblems were invented and introduced into the ornamentation of their buildings, but all else remained essentially Pagan. Indeed, it was the policy of the early Christian Church to facilitate the abandonment of the old worship, not only by the adoption into its ritual of certain old forms calculated to render the new doctrine palatable to the catechumens of the Church, but by the consecration of existing Pagan buildings to the new service. Thus we learn, from an inscription on the frieze of the Pantheon, that that building, which had been erected by Agrippa, in honour of Jove and all the gods, was by Boniface IV. consecrated to the Virgin and all the saints. So, also, a temple of Apollo became a Christian church dedicated to S. Apollinaris. Dr. Middleton tells us, too, of a church dedicated to S. Bacchus, and many similar instances might be adduced. Even the music chanted before the idols of Paganism was appropriated (as Burney surmises) and converted into Christian hymns. Indeed, as early as the fourth century, these equivocal practices of appropriation had extended so far as to have become a scandal in the minds of some stricter and more simple-minded Christians.

We may readily assume, therefore, that the subversion of Paganism was attended by no very appreciable change in the prevalent style of architecture. The circumstances of the times, however, ultimately wrought their effect, and a sort of transition style slid, as it were, into use, which, as I have already said, has been designated Romanesque. Perhaps one of the most curious as well as most authentic specimens of the earlier Romanesque are the relics of Theodoric's time, at Ravenna, in which we detect clear traces of the change that was gradually taking place, whilst a somewhat classical aspect was preserved, the builders of that period still seeking to retain the ancient Roman type. For centuries the reminiscences of the empire exercised their influence, and to build "more Romano" was the aim and boast of men at a time when all true classical feeling had long been extinct, and when even the arts of construction must have been nearly lost; for we find that when the builders desired to form a dome over the tomb of Theodoric, in humble imitation of those at Rome, they seem to have been driven to the whimsical expedient of scooping out a huge block of stone, 32 feet across, into the semblance of a spherical vault, and then lifting it bodily on to their walls.*

MEMORIAL CHURCH AT CONSTANTINOPLE.

THE accompanying engravings illustrate the selected design (by Mr. Burges) for the memorial church at Constantinople, referred to in previous articles. The author of it, as already stated, founded his design on a study of the church of St. Andrea, at Vercelli. We shall best set forth his views by quoting part of the memorial which was sent with his drawings:—

"Actuated by the ideas conveyed by this model, the first care of the author of this design was to ascertain what materials were to be readily found at Constantinople suitable for an edifice worthy of the nation by whom it was to be built, while the expense of re-opening quarries or of long land transit would forbid the introduction of any materials not in common use. From careful inquiries, made of competent persons who have been engaged for several years in building operations at Constantinople, it would appear that the choice of materials is limited to the following somewhat scanty list:—

The St. George's limestone, of a consistency between Portland and Bath stone.
The Maltese limestone, like Caen stone;
The Macrican stone, like the St. George's;
And a bluish black limestone, used principally for rubble walling.
The Marmora marble, of a dull cloudy white.
Italian marble, used for paving.
A red marble, from a quarry recently opened near Constantinople; and (now that a good understanding is established between the Turkish and Russian Governments) the Balaclava marble, which resembles the Siena, may possibly be obtained.
Bricks may be had of all colours, as well as terra cotta. The tiles resemble those of Italy, and the lime is to be had remarkably good.
For the roof, spruce fir is used, which comes from the shores of the Black Sea.

The design for the proposed church must naturally be influenced by the properties of these materials.

At the outset a difficulty presents itself. The church is essentially a memorial church, and should therefore be especially designed to contain monuments. For this purpose it appears to the author that a space should be separated from the rest of the church by a grille, so that there may be a space specially devoted to the preservation of monuments (many of which would doubtless be very costly), but which might be rendered available, when necessary, for the wants of the congregation. Impressed with the importance of this, the tower has reluctantly been omitted in favour of an ambulatory or space round the east end of the choir: at the same time, a design for the tower has been appended, in case of the funds becoming sufficiently increased to carry it out."

"For the sake of lightness, and in order to diminish the thrust, it is proposed to make the filling-in of the vaulting of a light concrete, like that used at Salisbury cathedral. It is much lighter than any stone, and, should a settlement occur, does not become detached in small pieces, as a brick vault would, but simply cracks. For a similar reason, it is carried over the ribs, and not rebated on to them. In France, where this system is followed, the author has seen several vaults (the cloisters of Rouen, for instance) where the ribs have fallen, but the filling-in remains quite perfect.

It is proposed to build the core of the walls with the rubble of black stone, and to face them inside and out with various ashlars of terra cotta, brick, and white and black stone. The Marmora marble will be confined to the dado of the nave,* the caps of the columns, and the tracery plane of the windows; while the black stone and red marble, slightly polished, will be employed for the various columns."

Many of the flat ornaments on the façade are to be formed simply by the stones being incised and filled up with a dark coloured cement: glass mosaics would also be introduced.

The cost is estimated at 20,000*l.*: the tower, if added, would entail an expenditure of 3,000*l.* more.

REFERENCES.

A. Altar.	E. Font.
B. Ambulatory for Monuments.	F. Lower Vestry.
C. Choir.	G. Press.
D. Pulpit.	H. Porch.
	I. Tower.

MR. BROWN, OF LIVERPOOL.—The commission for the portrait, to be painted, of the munificent friend of the Liverpool Free Library, Mr. Brown, M.P. has been entrusted to Sir Watson Gordon. The choice of the sculptor for the statue was not decided when we last heard, but lay, we believe, between Messrs. Foley, Marshall, and MacDowel.

* To be continued.

* It is proposed to cut the names of every officer and man who fell in the late war upon the panels of this dado; in fact, to follow the example of the Assyrian architects, who covered the alabaster dados of the palaces with inscriptions.

PROPOSED MEMORIAL CHURCH, CONSTANTINOPLE.—Selected Design, by Mr. W. Burges, Architect.

THE ARK ON MOUNT ARARAT.

MAJOR STUART'S description of the ascent of Mount Ararat by five Englishmen, published in the *Times* of August 22, 1856, is most interesting.

It appears from a letter in the same paper of a subsequent date, and from other statements, especially those in Dr. Kitto's work, that the summit of Mount Ararat was reached in 1829, and that it was *then* slightly convex, and almost *circular* in form, *the diameter being then* about 200 Paris feet. Major Stuart's description of it, as he found it in 1856, is different, and seems to me to give occasion for some curious inquiries. He states that "the whole surface of Mount Ararat bears evidence of having been subject to violent volcanic action;" also "the impression left on my mind is, that the summit is an extinct crater filled with snow." He states also that "the summit itself is nearly level, of a triangular shape, the base being about 200 yards in length, the perpendicular about 300." It is obvious that Major Stuart found the summit different both in form and dimensions from what it was in 1829: this would be consistent with the idea that probably it was much higher in 1829, from the accumulation of snow and ice; and as it is known that the mountain was shaken by a great earthquake in 1840, which threw down vast masses of ice and snow, and part of the rock itself (the latter probably carried away by the weight of the ice which might have been accumulating about 4,000 years), and as it does not appear that any lava has flowed from the summit, either at that period, or at any other time since the Flood, so far as I have been able to learn, it seems to me probable that the form and dimensions found by Major Stuart are much nearer to, and perhaps not very different from what they were at the period of the Flood, whether the ark rested on that mountain or not. Now, supposing that this is really the place where it did rest, is it an idea without some reasonable foundation to suppose not only that the ark may be there yet, but that the earthquake may lead to its discovery?

To suppose that the ark may be there yet may seem a startling idea, but that arises chiefly from the importance of the purpose for which the ark was used.

If we were told that a piece of good wood had been preserved 4,000 years, under favourable circumstances for preserving almost anything, it would not seem to be so very improbable, especially to those who are in the habit of finding black oak under the soil of low "car" or "fen" land,—which oak they call "old Noah,"—that name intimating how long they think it has been where they find it. Whether they are mistaken or not as to the exact period, the oak must have been there many centuries. A rough outline in the triangular form, described by Major Stuart, may be made in a minute on a separate piece of paper, and by holding the paper highest where he states that the particular part of the mountain's summit is highest, some of the following remarks may seem deserving of attention. Major Stuart states that "the highest point is the apex of the triangle: separated from it by a hollow is another point of nearly equal altitude, and the base of the triangle is an elevated ridge forming a third eminence."

Dr. Kitto had difficulty in supposing that the ark could become fixed on the top of a mountain, and therefore he thought that a word had been erroneously translated; but if he had seen Major Stuart's description of the form, and his dimensions of the summit of the larger Ararat, as it appeared in July, 1856, or sixteen years *after the earthquake of* 1840, perhaps he would have agreed with others in thinking that they are strikingly consistent with what we may suppose they would have been if the mountain, and the crater at the top of it, had been made for the especial purpose of receiving and retaining the ark. What is said in the Bible about the ark is in few words, but they are remarkably explicit. Noah was not to use his own discretion or judgment as to the proper dimensions of the ark, or even as to what wood he was to use; he received on both points clear directions.

Dr. Kitto and others state that there are different opinions as to whether the mountain described by Major Stuart is really that on which the ark rested, but they all admit that there is a very general belief that it is; so we may fairly suppose that before the recent ascent it was at least as likely as any other mountain.

Dr. Kitto intimates that for animals to come down it in safety would be almost as great a miracle as the Flood itself; but if we are to believe that five gentlemen have recently come down it in safety, and that one of them (Major Fraser) had previously shot down 1,000 feet of the most dangerous part, "now head, now feet foremost," and was so little injured, that he actually walked up to the summit immediately after that remarkable descent, surely we may believe that the animals could descend when their Preserver intended them to do so? Thus, Major Stuart's statement of facts tends to remove two of Dr. Kitto's *greatest* difficulties: some others mentioned by him may be got over by plain reasoning from well-known facts. The question recurs, is the place at the summit of the mountain now called Mount Ararat apparently well adapted for the purpose of receiving the ark, and preserving it? Major Stuart states that it is in the form already described, and that the base is 200 yards, or 600 feet; the perpendicular is 300 yards, or 900 feet. The ark was to be 300 cubits long, equal to 547 feet, and 50 cubits wide, equal to 91 feet. Do not, then, the dimensions of the summit correspond with those of the ark in a remarkable manner, after we have allowed for the "earthwork" outside of the supposed crater? If the ark floated in at the lowest part of the triangle summit, when there was just sufficient water to float it over that part of the summit of the mountain, the "elevated ridge," or base of the triangle would be likely to so impede, or alter the course of the ark as to hold it over the crater as in a wet dock. The wet dock would become a dry one as the water subsided, and if the ark really rested in it, is there not a probability that it is still there preserved in dry snow?

As five gentlemen have reached the summit, I wish to ask the question whether it may not be yet practicable to ascertain whether the ark really is there?

A. M. R. I.

CHURCH-BUILDING NEWS.

Ipswich.—The following tenders have been received for a new Congregational Chapel about to be erected at Ipswich under the direction of the Mr. F. Barnes, architect:—

Wright, Ipswich	.....	£2,701
Ringham, ditto	.....	3,019
Gibbons, ditto	.....	3,055
Baldiston, ditto	.....	3,355
Luff, ditto	.....	3,385
Simpson, ditto	.....	3,503
Colls and Co. London	.....	3,890

The building about to be removed is of the ordinary meeting-house character of a century and a half ago, but there is a residence attached to it, containing some very interesting oak carving, and an ornamental plaster ceiling of the seventeenth century in good condition. The new chapel is calculated to hold nearly 1,200 persons, and is designed in the Decorated style of Ecclesiastical architecture, in accordance with the advancing ideas of the leading members of the Dissenting interest.

Rickmansworth.—Several labourers employed on the works at the cemetery which is being formed at Rickmansworth, had a very narrow escape from accident last week, while engaged taking away the centres from underneath the arch of the entrance-gateway. One of the buttresses was observed to give way, and the men had scarcely time to get out of the way when the arch fell.

Llandaff.—The restoration of the interior of the cathedral has been nearly brought to a close, after an outlay of nearly 23,000*l.* An eminent Welsh iron-master, says a contemporary, being recently solicited for his subscription, asked the probable cost of the works. "23,000*l.* sir," said the applicant. "Good God!—two miles of railway!" emphatically exclaimed the man of iron, with a shrug of the shoulders.

Coventry.—The memorial window in commemoration of the death of the Hon. Colonel Hood, of Whitley Abbey, is now completed, and placed at the north-east end of St. Michael's Church. The subject is "The Ascension," and its execution was entrusted to Messrs. Heaton and Butler, of London. The stone-work was by Mr. Platt, of Coventry.

St. Helens.—The church of the Holy Trinity, erected on the north side of Traverse-street, Parr-mount, St. Helens, as a chapel of ease in connection with St. Mary's parish church, has been consecrated. It is a cruciform building in the Gothic style of architecture, and is built of the black slag produced from the copper furnaces, which, contrasted with the red sandstone quoins and tracings of the windows, gives the edifice rather a striking appearance. The windows of the nave are ornamented with stained glass borders and texts. The church contains about 650 sittings, 389 free. It has been erected at a cost of about 2,500*l.* by Messrs. Harris and Sherrat, builders, St. Helens; Messrs. Hay, of Liverpool, being the architects. Attached to it are boys', girls', and infants' schools, in which 200 children are being daily educated; and it is intended to erect a parsonage-house adjoining.

Doncaster.—In reference to improvements at Christ Church, Doncaster, the local *Gazette* states that the patron and incumbent have in contemplation the removal of the eastern window, and to replace therein another of five lights, and decorated. The reredos will be formed of marble shafts, with provision for the tablets, containing the commandments, &c. and running crocketed gables, terminating with carved finials. The lights will be filled with stained glass. The design is the production of Mr. Scott. The work has been let to Messrs. Ireson, of Northampton, for 245*l.* The carving is to be executed by Mr. Phillips. This alteration will not interfere with the service, as the stone will be prepared before the window is removed, and the new one will be erected in the course of a week. It is also intended to have a new pulpit and reading-desk of wood, after drawings by Mr. Scott.

PROVINCIAL NEWS.

Banbury.—The site for the Cornhill Corn-exchange, says the local *Guardian* of last week, will apparently be cleared by the end of the week. To the accepted tender of Mr. Kimberley, should be added one of Messrs. Thorpe and Pounder for carving, 135*l.* An alteration in the design as first exhibited has been made, by elevating the base of the building, so as to give an approach to the various entrances by steps. The architect is Mr. Hill, of Leeds.

Portsmouth. — In reference to the garrison gates for the Portsmouth Dockyard Railway, a Hampshire paper says,—Mr. Bushby has, in connection with his contract for making the railway, a curiosity on his Littlehampton premises, in the garrison gates. They are in pairs, with a semi-circular head, are of the best picked oak, solid, and of 6 inches thickness throughout, except that the flush panels, which are moulded, are in two thicknesses, of 3 inches each, in order that the plank on one side might be put in diagonally. The gates are of the weight of 3½ tons a pair. The railway is now nearly completed as far as the dockyard itself. It is rather over a mile in length—about 1,800 yards.

Salisbury.—An effort is being made to erect, in St. Edmund's parish, schools for boys, girls, and infants, together with residences for the master and mistress. The probable cost of the buildings will be about 1,800*l.* and if a moiety can be raised by private subscription, the other half will probably be supplied by the Committee of Council on Education. A site in Bedwin-street has already been purchased at a cost of upwards of 200*l.* and more than 350*l.* have been subscribed towards the object.

Pembroke.—The extensions and improvement of the dockyard at Pembroke are this year to be carried out to the extent of 120,000*l.* The widening of the entrance dock is to cost 8,000*l.* and the lengthening and widening of the dock, so long in hand, 20,000*l.* The two new slips and boat-basin extending along the wharf are also to be carried on, and these, with provision for scouring away mud in front of the dockyard, will cost 30,000*l.* The erection of larger saw-mills, engine-house, workshops, a new foundry, and plumbers' shops, is to cost upwards of 20,000*l.* The saw-mills are advancing towards completion, and sheds are being extended. The foundry is to be erected on the site of the old iron store. New slips are being constructed. The work of each contractor is performed under the superintendence of an inspector.

Mansfield.—The Bentinck monument, some years ago erected in the market-place, is said to be in a neglected state. The monument itself wants completion by the introduction of a figure of Lord George, in the opening left for that purpose. The church of St. Johns, lately erected in this town, with the two chapels now in progress for the cemetery on the Nottingham-road, says the *Nottingham Guardian*, when completed, will strongly contrast with the dingy appearance of the monument.

Liverpool.—The contractors for the landing-stage, Messrs. Thomas Vernon and Son, have made such progress with the work, that within a few weeks from the present time the whole of this gigantic work, according to the *Journal*, will be completed. All the air-tight pontoons, or floating tanks, have been completed and placed in relative position. That connection also has been fixed by the placing of the longitudinal kelsons; and the wood framing for supporting the stage has likewise been finished. The deck or flooring of the stage has been nearly all laid down, fastened, and caulked; about a fourth part only of the deck remaining to be laid. The stage is 1,000 feet, or nearly a quarter of a mile, in length, perfectly level to within a few feet of each end, where a gentle slope allows easy access to vessels of comparatively small size; and at two points, near the centre, similar accommodation is afforded by short flights of steps. For the convenience of launching and floating, the stage has been disconnected at three equidistant points. The connecting bridges, four in number, are ready at Manchester for being put together.

Preston.—The foundation-stone of the new Petty Sessions Court and Police Station, Preston, was laid last week by the mayor. The site is in Lancaster-road. The new building will have a frontage to Lancaster-road, and also to Earl-street, which runs from Lancaster-road to Back-lane.

Norwich.—The free library will be thrown open to the public on Monday.——A railing has just been placed round the Wellington statue, in the Market-place, under the direction of Mr. Benest, the city surveyor.

FOREIGN INTELLIGENCE.

Munich.—Restoration of the Dome.—Although the cathedral of Munich is not one of the most important in Germany, its restoration has been taken in hand, but the way in which it is to be done is not yet quite settled. Messrs. Bergen and Foltz, architects, are engaged to assist the meetings. It has been resolved that the arch, of the Renaissance style, which intercepts the principal nave, is to be removed, as well as the old rubbish of closets and platform, surrounding the choir. After the effect thus produced has been ascertained, the demolition of two lateral altars and the principal altar encumbering the choir will be begun.

Hamburg.—Demolition of an old Building.—The so-called Baumhaus, one of the oldest buildings of the House city, will be removed. It was built by the architect, Hans Hamelin, in 1622, in the Netherland style; and from its uppermost story, surrounded by two verandahs, one of the finest views of the city, and the Elbe harbour, is to be enjoyed. Being situate at the end of the Steinhöft, the surrounding streets will profit by the demolition; still it was a fine memento of the traffic of old, once carried on within its walls.

Paris.—New Scientific Inventions.—The barometer (of Toricelli) consists in the method of *measuring* the pressure of the atmosphere. The Father Secchi, of the Observatory of Rome, has invented an instrument to *weigh* the pressure of the atmospheric column.——M. Seguin has invented a steam-engine, which utilizes the heat of the steam after it has exercised its moving force.——After 1,300 patents have been taken out in France and England, for the consumption of smoke in steam-engines, a new *grille à gradius* promises to supersede them all.——A new mode of panification,—the making of cheap bread of perfect whiteness,—has been invented in France.

THE ARCHITECTURAL ASSOCIATION.

THE meetings of the Association are continued with regularity, and some interesting papers have been read. The condition of the finances has been brought before the Association, and it has been shown that at the end of the session it will be in debt 50*l.* The expenses of the Architectural Exhibition first caused the deficiency, and the cost of the *conversazioni* given during the present session has increased it. The following resolution, proposed by Mr. T. J. Rawlins, and seconded by Mr. B. A. C. Herring, was passed at the last meeting:—

"That considering that the full benefits to be derived from the Architectural Association cannot be realised until the existing debt be cleared off, it is expedient that a subscription be entered into forthwith, and that the friends and members of this Association be solicited to aid in enlarging its sphere of action. That the amount of subscription for the above purpose shall not exceed the sum of 1*l.* each person."

It is most desirable that the Association should be relieved from the embarrassment of debt, and we trust that its friends will come forward in aid of the endeavour now being made to effect this. The treasurer, Mr. Bunker (1, Danes-inn, Strand), will receive subscriptions.

THE ARCHITECTS' BENEVOLENT SOCIETY.

ON Wednesday, the 11th, the general meeting of this excellent society was held in the rooms of the Royal Institute of British Architects, by the permission of the council. Mr. B. Ferrey presided, and addressed the meeting in favour of the objects of the society. The report of the council which was read congratulated the members on the fact that no diminution had taken place in the amount of the subscriptions, and proceeded thus:—

"A sense of delicacy forbids, of course, our adverting to particular cases, but we feel it incumbent on us to state that several cases of a peculiarly painful nature have come before us during the past year. It appears to us one of the strongest recommendations of our society, in which both those who give and those who receive are alike members of the same profession, that it affords the means of, in some measure, alleviating the sad consequences of those reverses to which all are liable, without aggravating the distress of the unfortunate recipients, by making it known out of the pale of the profession.

We take this opportunity of cordially and earnestly entreating our provincial members, and especially our corresponding members of council, to extend the sphere of our usefulness, by making widely known the name and objects of the society, and by augmenting the list of its members.

Amidst the eager competition, and occasionally opposing interests, which are too apt to disunite the members of our profession, this society appears to form an agreeable spot of neutral ground, on which all may meet with no feeling but that of kindness, and no object but that of mutual assistance."

The balance showed that during the year the sum of 244*l.* 11s. had been received in donations and subscriptions, and that 170*l.* 5s. had been paid to applicants for aid. The sum funded amounts to 707*l.* 13s. 8d.

Donations were announced from Messrs. M. D. Wyatt, 5*l.* 5s.; H. E. Kendall, jun. 5*l.* 5s.; T. E. Kendall, 5*l.* 5s.; David Brandon, 5*l.* 5s.; C. C. Nelson, 5*l.* 5s.; George Mair, 5*l.* 5s.; H. B. Hodson, 5*l.* 5s.; and W. W. Pocock, 4*l.* 4s.

The committee and officers were re-elected; and various votes of thanks, including one to the honorary secretary, Mr. John Turner, were passed; Mr. Charles Mayhew, Mr. Sancton Wood, Mr. Pocock, Mr. Papworth, Mr. Tite, M.P. Mr. Hesketh, Mr. Simmons, Mr. W. Papworth, and others, taking part in the proceedings.

The number of members ought to be very much larger than it is, and we invite our readers to help in making it so.

THE REVEILLE!

(*As sung in the* Fens, *near Spalding.*)
(*After Shakespere,—a long way.*)

HARK! hark! A Clerk at Moulton sings,
And *two pounds* is the prize
He offers for those trivial things,
The architect supplies;
And winking governors begin
To close their knowing eyes,
And hope for plans that pretty bin;
Sweet architects, arise!
Arise, arise!

J——s S——t.

THE CASTS IN THE GOVERNMENT MUSEUM.

A VERY competent authority writes to us as follows: The authorities at the new Exhibition building at Brompton are now arranging their classic casts; but the classification seems to be confided to inexperienced hands; for, instead of the visitor being instructed by the proper classification of the objects, the Greek and Mediæval are mixed up with Roman; and the portions of the same edifice, instead of being kept together, are promiscuously mixed. Thus the visitor will be bewildered and led astray, and the judgment of the guides of the public taste be a subject of great ridicule.

BURLINGTON HOUSE.

THE new meeting-room and library for the Royal Society, which have been formed under the direction of the Office of Works, Whitehall, in the western wing of Burlington House, are now ready for the decorator. The meeting-room is an apartment of large size, 77 feet long, 42 feet wide, and about 30 feet high. Here the fine collection of portraits, belonging to the society, will be open to the public at stated times. It will be heated by hot water. The library is a room of good size, but comparatively low. Mr. Myers and Mr. Smith, of Pimlico, have executed the principal works.

THE LONDON HOMES OF EMINENT MEN.

IN various of the old parts of London, inscriptions are to be found, which from time to time have been renovated by well-disposed persons, and which help often to give an interest to the long and monotonous walks some are often obliged to take along London streets. This goodly custom has of late years been almost abandoned, although many matters might be noted at small expense which would give much interest to what are at the present time unmeaning blocks of brick and mortar. In particular, it would be well worth while to affix small tablets to houses in which eminent men have been born or lived. On the house once occupied by Milton, in Westminster, a stone has been put up, on which is inscribed that the house was formerly the residence of the "Prince of Poets." This, however, is placed at the back of the premises, and is of course not visible to the generality of passengers.

It is surprising often to find the great difficulty there is, particularly in London, of getting information in the neighbourhood respecting places which have historical and other associations. We went a little while ago in search of the birthplace of Turner, the landscape painter; and, although provided with the number of the house, thought it better to inquire how much of the prophet was known in his own land. The respectable man of business who actually occupies the place in which the greatest landscape painter the world has yet produced was born, was not aware of the circumstance; nor were other persons living round about better informed. Would it not be worth while to place a record on this house (24, Maiden-lane, Covent-garden), and also on No. 47, Queen Anne-street, where he so long resided and produced such famous works?

Scores of houses in London could be mentioned which might with much advantage be treated in a similar manner; for instance, the house occupied for long by Woollett, the engraver, in Green-street, not far from the National Gallery, on the top of which the engraver was in the practice of firing a small piece of ordnance on the completion of an important plate.

There is also Hogarth's house, in St. Martin's-lane, where he resided before his removal to the square. The residences of Newton, Reynolds, Lawrence, and others, are well worthy of a mark; so is the house in Brook-street, in which poor Chatterton unhappily died. There is also the poet Dryden's house, in Fetter-lane; places connected with Benjamin Franklin, and a hundred others. Many of the London streets are dreary enough, and would be much enlivened by such memorials, which, in many instances, would add to the value of the premises. We throw out this hint, not for the first time, in the hope that it may be the means of inducing some of the owners of property which has a public interest to state, shortly, the circumstances, in a visible and permanent manner.

THE BUILDING TRADES.

WE have received statements, addressed to Tradesmen of all Callings, and signed Thos. M'Anaspie, proposing the formation of a "Trades' Protective and Grievance Society." The following will show the object of the proposed association:—

"Perceiving there is a spirit abroad, and that it is admitted on all hands that something is wrong which requires a great radical change, we therefore submit that each separate trade is entitled to the full control and benefit of that trade; and we call upon the public and Government Boards, private persons and men of business, as well as all architects, at once to alter the mode lately adopted in the advertising or giving away of the different contracts under their control. In place of giving to one capitalist the power and benefit of monopolising the work of eight or ten separate trades, let them subdivide the contracts, and thus give an opportunity to each tradesman to contract for his own department. By so doing there would be more competition, less jobbing, and the work would be done better and cheaper, as each trade would be more competent to inspect his or their own department, and thus a stimulus would be given to emulation, and the talent of the country would not emigrate to America and elsewhere."

THE ART-UNION OF LONDON.

OUR advertising columns have shown that the subscription lists will close on the last day of the present month, and we take the liberty of suggesting to such of our readers as may not already be members of the Art-Union of London, the desirability of becoming so forthwith, not merely because of the personal advantages, equal to much more than the amount subscribed, but because of the great good which has been effected, and is being effected, by the Society's operations. By its means more than a quarter of a million of money has been spent in aid of art and artists, not one sixpence of which would otherwise have been so spent; a love of art has been widely induced, and a desire for knowledge of it spread. Each subscriber for the current year will receive, on payment of his guinea, two prints, "The Clemency of Cœur-de-Lion," by H. C. Shenton, from the picture by John Cross, which gained the Government premium of 300*l.*; and "The Piper," by Edward Goodall, from the original picture by Frederick Goodall, A.R.A.; to say nothing of the chance of obtaining one of the prizes to be allotted in April next, which will include the right to select for himself a work of art from one of the public exhibitions, statuettes in bronze and porcelain, medals, mezzotints, and lithographs. Should the prints of the year not suit the taste of the subscriber, previous works may be taken in lieu. "The Piper," by the way, engraved by the father after the son, is a very charming specimen of the art of both, and is sure to be popular.

WORK TO BE DONE.

THAT bread, &c. may fall, let us no longer be dependent on foreign supply for our daily wants, but cultivate the waste lands, most particularly those near the metropolis; such as our Wimbledon, Wandsworth, Tooting, and Barnes commons, all within the reach of its manure and sewage. Look at Hounslow-heath as an example. 2ndly. For remunerating employment, and plenty of it,—put a spade, pickaxe, or hoe, into the hands of the unemployed, and let them drain, trench, and level these and other wastes. Suppose we tried the experiment with a few. Could you find ten times as many hands, in shape of discharged prisoners and others, there is work for them, by which the cause of humanity would be essentially served, the noble horse saved his suffering, and the country benefited beyond belief. It is, in a word, by laying down the granite kerbstones of the streets, in a double line, for the wheels of all carriages to run on, as in Friday-street, Bread-street, Cheapside, the Commercial-road, our Reigate-hill, the Corso of

Milan, &c.; or, perhaps, large blocks of semi-vitrified clay, or other hard, impervious substances, might answer the purpose. In streets of great traffic, these double lines, on the near and off sides, leaving the middle for passing, of gravel, if you please. In streets of less traffic, two lines in the centre would suffice. At one blow, you abolish the distracting noise of the City, its dust, dirt, and, I had almost said, draft of the horse. Mr. Jessop proved, before the Lords, that one horse, on the Darlington railway, drew 12 tons, three miles an hour; that one gig-horse drew forty-one people eight miles an hour. Thus, half the number of horses would be dispensed with,—much of the lost traffic, pleasure, and convenience of the public roads would return,—the produce of the land consumed by horses,—and Sir James McAdam assured me, "it was four acres per horse per annum,—enough for eight men,"—would afford employment and bread for the poor,—and there would "be no complaining in the streets."

D. F. WALKER.

TURKISH CEMENT.

THE Turks use common red earthenware pipes, with socket-joints, to convey water from springs to reservoirs and fountains. They make and use mortars and cements as under:—

Mortar.—Fresh slaked hydraulic lime, one part, by measure; pounded brick or tile, finely sifted, one part, by measure; chopped tow, sufficient to mix into the consistency of ordinary hair mortar;—the ingredients to be mixed dry immediately before use, and then to be well incorporatedby the aid of water;—the mortar to be used fresh.

Cement.—Fresh slaked hydraulic lime, one part, by measure; pounded brick or tile, finely sifted, half part, by measure; chopped tow as above;—the whole mixed with oil, in place of water.

The earthenware pipe-joints are made water-tight with this cement.

ARCHITECTURAL INSTITUTE OF SCOTLAND.

A MEETING of the Architectural Institute of Scotland was held in Glasgow, on the 25th ult. when Mr. John Murray, of Murrayfield, advocate, read a paper on Church Towers, with special reference to the towers of parish and lesser churches. He said that the original type of the church towers of this country was to be found in Italy. The northern architects, however, introduced an important change in the disposition of the building, and the tower was generally made an integral part of the plan of the church instead of being detached as in Italy. This modification of the plan of the Romanesque church and campanile had always been a distinguishing feature of northern church architecture, though it might with some ground be maintained that it was not adopted by the Celtic tribes. The lecturer proceeded to point out some of the most prominent characteristics of the Norman, Early English, Decorated, and Perpendicular towers of England and Scotland, and concluded with some hints regarding modern adaptations, condemning in strong terms the very common practice of adopting the Gothic steeple and applying to it Italian details.

In the course of the conversation which followed, it was observed that many of the Celtic towers referred to by the lecturer were in reality more ancient than any of the campaniles of Italy.

Mr. Honeyman remarked that the nomenclature adopted by Rickman, when applied to Scotch architecture, was quite unintelligible, and that a perfectly different and independent classification was absolutely necessary to prevent confusion.

SMOKY CHIMNEYS.

SINCE no abler pen than mine has been taken up to furnish your correspondent, "X." with an answer to his question, I will, with your permission, trouble your readers with a few remarks; but do so more in the hope of eliciting further information than with the idea that my mite of knowledge will be of much use to them.

Smoky chimneys are the architects' bugbear: they cause more trouble between them and their clients than almost any other subject. As such, surely they should be dealt with boldly, and an attempt be made to exterminate so great an evil, instead of allowing it to remain as it is, unexamined and unheeded.

The cause of smoky chimneys is usually, if not always, down-draught. A body of heated air ascends, but being rarified, cold air has a tendency to rush into it to keep up the equilibrium. There is, therefore, I presume, always some down-draught in the *top* of every chimney; but it is only when it overcomes the tendency of the hot air to ascend that a chimney smokes.

The various methods in use for supplying cold air direct to the fire appear to me to be useful; thus, by bringing oxygen freely to the fuel, causing more rapid and perfect combustion, thereby diminishing the quantity of smoke, and by diluting the remainder to such an extent that we have a column of comparatively-speaking pure heated air rather than one heavily charged with carbon ascending the flue.

The cowls which *adorn* our housetops are, theoretically speaking, useless; for it is absurd to attempt to interrupt nature. Equilibrium must be maintained. How far they practically answer their purpose, your readers will be the best judges. For myself, I am convinced that their success is in any case fortuitous, rather than the result of experience.

There is in use a ventilator, the principle of which I would apply to chimneys.

Two tubes are fixed in the ceiling, near each other, and it is found that hot air ascends the one whilst cold descends the other. I would therefore divide the flue at the top, and for some distance downwards, into two, with perhaps sheet iron or zinc. Experiment must at first determine how far down it is necessary to bring this division; but of course the nearer it approaches the fire the hotter will be the smoke, which will therefore ascend more rapidly, and create more draught. It will pass up one side of the division, and carry the cold air which has descended on the other up with it. Cold air will, to a certain extent, descend in every flue; therefore let us make an entrance especially for it.

A. F.

ILLUMINATED CLOCKS.

THE attention of the readers of the *Builder* having recently been directed to the subject of illuminated clocks, perhaps the following suggestion for their improvement may be of interest.

In the science of optics it is an admitted fact that white on a black surface is visible at a much greater distance than black on white. In accordance with this axiom I suggest that the usual mode of constructing illuminated clocks be reversed; that is, instead of the entire face being illuminated and the figures and hands showing black, the figures and hands are proposed to be illuminated and the face black. To effect this object, the dial must be of copper, or some other opaque material painted black;—the figures and hands being perforated, and filled in with white transparent porcelain;—the dial to be constructed of three concentric parts, the outermost of which (for the figures), to be fixed, and the other two parts, with the openings in them to serve as hands or pointers, to revolve. It is obvious that there is the further advantage, in this arrangement, of avoiding the necessity of counterpoising the hands.

GEO. GUILLAUME.

LOCKS AND KEYS.

As one of your oldest subscribers, and who has seldom troubled you with a letter, may I now beg the favour of a short space on the subject of "locks and keys," so fully treated by you in the *Builder* of the 28th ult.?

I shall not enter into the question as to whether a certain lock or locks may or may not be scientifically picked. I have no intention of attacking the inventions of other manufacturers, my sole object being to uphold the reputation of my own. The question, so far as my locks are concerned, is this: are they not proved by practical use to answer the purpose for which they are intended, viz. to keep property safe from thieves and housebreakers? I am content to let their reputation rest upon this test. Notwithstanding the controversies, lectures, and illustrated hand-books on the subject of lock-picking, equally accessible to thieves and honest men, the result has been that public confidence in the security of Chubb's locks has increased instead of diminished. Some people, it is true, expect perfect impossibilities, and imagine that having obtained a secure lock they have done all that is necessary. This is a great mistake. No lock whatever will guard against culpable negligence with regard to its key; or, as in the late South-Eastern bullion robbery, the treachery of supposed trustworthy servants.*

Since 1851, I have made and adopted many improvements in my locks, besides those you mention, and more still have been tried and rejected, as interfering with their proper working. Complexity of action in any lock will, sooner or later, invariably prove fatal to its success. A lock is not like a watch, or other delicate machine, that is treated with a considerable amount of carefulness. It is subject to every-day hard wear and rough usage; and it has been, as it always will be, my endeavour not to overlook these facts in making whatever may from time to time appear to be desirable alterations or additions. Absolute perfection is perhaps as unattainable in locks as in other matters, nevertheless the present is an age of progress. Lock patents by scores have appeared within the last seven years; some good, others indifferent or bad in principle, and many of them embracing as new ideas certain principles of construction long since exploded or laid aside. Of those practically defunct (and they are many), my opinion is, that the ingenuity of their inventors has generally been allowed to overrun their perception of the before-mentioned fact, viz. that a lock is a very hard-worked machine, and that in its construction *simplicity* is as necessary an element as *security*.

JOHN CHUBB.

* It will be remembered that the notorious lock-picker Agar said the robbery would be impossible unless copies of the keys could be taken. By the connivance of Tester this was accomplished, and yet the duplicate keys thus made were useless until Agar had travelled seven or eight times to Folkestone with the chests, altering the keys until they fitted.

REGULATIONS AS TO THE FORMATION OF NEW STREETS IN THE METROPOLIS.

METROPOLITAN BOARD OF WORKS.

AT a special meeting of the Metropolitan Board of Works, held on Tuesday, the 10th inst. Mr. J. Thwaites in the chair, the following by-laws were agreed to:—

"1. Six weeks at least before any new street shall be laid out, written notice shall be given to the Metropolitan Board of Works, at their office, No. 1, Greek-street, Soho, in the county of Middlesex, by the person or persons intending to lay out such new street, stating the proposed level and width thereof, and accompanied by a plan of the ground, showing the local situation of the same.

2. Forty feet, at the least, shall be the width of every new street intended for carriage traffic; 20 feet, at the least, shall be the width of every new street intended only for foot traffic; 20 feet, at the least, shall be the width of every new mews; provided that the said width, respectively, shall be construed to mean the width of the carriage and footway only, exclusive of any gardens, forecourts, open areas, or other spaces in front of the houses or buildings erected, or intended to be erected, in any street or mews.

3. Every new street and every new mews shall, unless the Metropolitan Board of Works otherwise consent in writing, have, at the least, two entrances of the full width of such street or mews, and shall be open from the ground upward.

4. The measurement of the width of every street shall be taken at a right angle to the course thereof half on either side, from the centre or crown of the roadway to the external wall or front of the intended houses or buildings on each side thereof; but where fore-courts or other spaces are intended to be left in front of the houses or buildings, then the width of the street, as already defined, shall be measured from the centre line up to the fence, railing, or boundary dividing or intended to divide such fore-courts, gardens, or spaces from the public way.

5. The carriageway of every new street must curve or fall from the centre or crown thereof, at the rate of three-eighths of an inch, at the least, for every foot of breadth.

6. In every new street the curb to each footpath must not be less than 6 nor more than 8 inches in height above the channel of roadway, except in the case of crossings paved or formed for the use of foot passengers; and the slope of every footpath must be half an inch to every foot of width if the footpath be unpaved, or not less than a quarter of an inch to every foot of width if the footpath be paved.

7. In these by-laws the word 'street' shall be interpreted to apply to and include any highway (except the carriageway of any turnpike road), and any road, lane, footway, square, court, alley, or passage, whether a thoroughfare or not, and a part of any such highway, road, lane, footway, square, court, alley, or passage."

INSTITUTION OF CIVIL ENGINEERS.

ON the 3rd inst. Mr. I. K. Brunel, V.P. in the chair, the paper read was "On the Results of the Use of Clay Retorts for Gasmaking," by Mr. Jabez Church. The substitution of fire-clay for metal, in the construction of retorts, was attributed to Mr. Grafton, and dated back as far as the year 1820. Originally they were square in transverse section, but that form was soon changed for the ⌂, or oven-shape, which had been since adhered to, both in this country and abroad; this latter form of retort admitting of a stratum of coal being distributed of an equal thickness throughout.

The comparative quantities of gas made by iron and clay retorts, of the ⌂ form, of 15 inches by 13 inches in section, and 7 feet 6 inches in length, had been found by the author to be as follows:—

The iron retorts lasting 365 days, and working off $1\frac{1}{2}$ cwt. of coal for each charge, effected the carbonization of 2,190 cwt. of coal, which, at 9,000 cubic feet of gas per ton, gave a total quantity of 985,500 cubic feet of gas per retort; whilst the clay retorts lasted 912 days, carbonized 5,472 cwt. of coal, which, at 9,000 cubic feet of gas per ton, gave 2,462,000 cubic feet of gas per retort. It would thus be seen, that the clay retorts yielded a greater quantity of gas, from the same weight of coal, than the iron retorts, but the specific gravity of the gas so made was less and its illuminating power was diminished, in consequence of the increased temperature of the clay retorts, which caused the last portion of the gas to be decomposed.

The most practical method of working clay retorts in large works was with the addition of an exhauster. This reduced the pressure on the retort, and prevented the escape of gas through the pores and fissures; and by that system the quantity made was increased about 200 cubic feet per ton of coal. In small works, the expense of an exhausting apparatus, and steam machinery to work it, would not be compensated by the gas saved.

THE EMBANKMENT OF THE THAMES.

IN a paper read at the Society of Arts on the 11th ult. Mr. Bridges Adams spoke of the great accommodation afforded by railroads in several cities of the United States, and advocated that similar ones should be established in London, recommending the way in which they could be conveniently constructed. In the discussion on this subject, objections were raised to such railroads on account of the narrowness of the streets; but though this might be the case in some localities, it was not pretended to hold good in other instances. Mr. Bennoch proposed, instead of such

railroads in the streets, to construct one on an embankment of the Thames; but these two plans need not interfere with each other. For instance, a proposal of Mr. Page's for this purpose was entertained by the Government Commissioners for the Improvement of the Port of London about a dozen years ago, and they said the necessary funds might be raised by a tax on the coals imported. This appearing objectionable, I ventured to submit to the commissioners a proposal by which the expenditure might be rendered self-paying, as in several works of the late Sir Samuel Bentham.

In the first place, instead of a sewer on the lowest story of the embankment, it was suggested that this portion should be appropriated to warehouses for inflammatory stores, such as tar, &c. which could be easily submerged, such storehouses being well dried and ventilated. Sir Samuel gave a convincing proof of their efficiency in Portsmouth Yard, where the subterraneous cellars over the reservoirs were used for the desiccation of block shells. An upper tier of warehouses was proposed by me for such goods as timber and planks, likewise capable of being flooded, and a portion of the chambers always above water were intended for rooms for refreshments, such as pastry-cooks, restaurants, &c. The surface of the embankment was proposed to be strengthened by Sir Samuel's mode of projecting iron stays, which would at the same time protect foot passengers from the railroad carriages. This embankment was to be on a level with the street. Another feature of this plan was the leaving the existing wharfs and warehouses within the embankment (thus obviating one of the most powerful objections to the scheme) by keeping the water up to a convenient height, and avoiding the emanations from muddy banks. There are various details in the proposed plan which might be worthy of consideration, should this embankment be carried out.

M. S. B.

Books Received.

The Kirk and the Manse. By the Rev. ROBERT M. FRASER, M.A. Fullarton and Co. London, Edinburgh, and Dublin.

THE twentieth part, just now published, concludes this work, which consists of sixty illustrative views in tinted lithography, of parish kirks and manses in Scotland, by Messrs. A. and J. Macpherson, with descriptive and historical notices, and an introduction. Mr. Fraser remarks, in the latter, on not only the want of taste as to Ecclesiastical architecture in Scotland, but the positive prejudice against it which has prevailed, and rejoices in the great change for the better in that respect which is now evident.

Considerable improvement has been observable in the views during the progress of the work.

VARIORUM.

THE "Essay on Labourers' Cottages" for which the Royal Agricultural Society awarded their medal to Mr. T. W. P. Isaac has been printed in their journal and reprinted in a pamphlet form.——"Australian Essays, on subjects Political, Moral, and Religious," by Mr. James Norton, Sen., Member of the Legislative Council of New South Wales (Longman and Co. publishers), are interesting, from their antipodal origin, and show that literature is making its own way in the wilds of the true new world of modern times. Indeed, one cannot well conceive a position more suitable to the exercise of the reflective faculties than the solitude of "the bush," unless, by the way, some hungry bushranger, native or transported, happen to have his eye upon the reflective *absentee*. We suspect, however, that even though an Australian, our present author is much more familiar with the "legislative council" than the "bush." His essays, at all events, display no Crusoean isolation from his mother country, as his interest in the Gorham and other English questions of the (waning) day will testify. The most interesting to us amongst his essays, nevertheless, are those which relate to Australia itself. Mr. Norton complains of the apathy of his co-exiles in respect to the advantages of railway and telegraphic communication, and urges them to reflection and to action on the subject. One of his essays contains an account of Port Jackson and the City of Sydney, in which it is painful to be reminded that the town of Sydney is still "totally undrained," and still full of pallid ghost-like faces which proclaim the malarious influence under which they suffer.——That original and somewhat eccentric author, Mr. Alfred Smee, has just had published, by Longman, a tract titled "The Monogenesis of Physical Forces," forming the subject of a lecture delivered by him at the London Institution, on 18th ult. Mr. Smee is evidently labouring in a rich mine of thought, but the ore he may have as yet dug out is rather crude and meagre. The correlation (or identity rather) of the physical forces, so far forth as they manifest the influence of *attractive* power, he appears to appreciate, but although the changes of convertibility in such forces may be rung *ad infinitum*, his ideas seem to be exceedingly defective so far as regards not only the power antithetical to attraction, namely, repulsion (if, indeed, it be proper to use such hypothetical terms as either of these), but also as regards the forms (or whatever else they may be) on which those *differences* depend, which plainly show themselves amid the *identity*, in light, heat, actinism, &c. and their correlative and co-operative antitheses. The causes of *difference*, in the midst of *identity*, while treating of mechanical force, hydrostatic force, and pneumatic force, Mr. Smee sees, so far, clearly enough, where he says that "when a new attraction is exerted, the force emanating therefrom may be propagated through aëriform bodies, when it is termed pneumatical force; through fluid bodies, when it is called hydrostatic force; through solid bodies, when it is called mechanical force." Why does he not endeavour to point out how light, heat, &c. *differ* in a similar way, as they plainly do, though not exactly from the same causes? In fact, however, he has not caught the identity in these forces, far less the difference.

Miscellanea.

MANSFIELD CEMETERY.—On Tuesday, the 24th ult. the first stone of the chapels proposed to be erected in this cemetery was laid by Sir Edward Samuel Walker, the chairman of the Alansfield Burial Board, amidst a large assemblage of people. A bottle, containing the current coin of the realm, and a scroll of parchment, inscribed with a statement of the event, was deposited under the stone, after which a suitable address was delivered by Sir Edward, who spoke of the beautiful site which, under the Act for inclosing part of Sherwood Forest, had been set apart for the purposes of a cemetery, and which, in a few years, when the shrubs had become well rooted, would be second to none in England, its natural beauties being such as to require little aid from the landscape gardener, and being adorned with a few relics of "merrie" Sherwood's rare old oaks. The ground contains ten acres, situated about a mile south of Mansfield, on the Nottingham road. The architects are Messrs. Pritchett and Sons, of Darlington. Mr. Lindley, of Mansfield, is the builder; and Mr. Mansell Powell, the clerk of the works.

THE SEWERAGE OF TYNEMOUTH AND NORTH SHIELDS.—Mr. R. Rawlinson, C.E. has reported to the local Board of Health for the borough of Tynemouth on the completion of their public sewerage works, of which he was the engineer. The following extract from the report will show generally what has been done, and at what cost:—"The estimate given in my report of October, 1854, provided for 16,162 lineal yards of cast-iron, brick, and earthenware pipe sewers, together with 150 manholes and lampholes, 600 gullies, and three flushing chambers. The total cost was estimated at 13,668*l*. I have before stated that the General Board of Health suggested some additional works and alterations in the arrangement of sewers. The cost of these was estimated at 800*l*. making a total sum of 14,468*l*. as required for the completion of the public sewers. The total length of public sewers actually laid down amounts to 18,046 yards; the number of manholes and lampholes to 276; and the gullies (fixed) to 559—42 remaining in stock—making a total of 601. The cost of these works, including payments amounting to 304*l*. 17s. 11d. for previously existing sewers which have been adopted, together with all engineering and other expenses, will not exceed the sum of 12,500*l*." Two outlets have been provided for the Tynemouth village discharge, and seven for North Shields.

THE LONDONDERRY MONUMENT. — The foundation-stone of the monument to the memory of the late Marquis of Londonderry was laid on Saturday week, and was witnessed by a large assemblage of people from Belfast and the Londonderry estate, including the Marquis and Marchioness, and a party from Mount Stewart. The spot selected for the site is the summit of one of the loftiest hills of the Scrabo range, within a mile or two of Newtownards. The monument is to be a tower, square in shape, and rising to a height of 130 feet. There will be a guard chamber, and a winding stair will conduct to the battlements, which are to be at a height of 95 feet from the base. At the east corner of the square a round tower is to rise, which will form a conspicuous landmark visible to a great distance at sea. The plan is by Messrs. Lanyon and Lynn, architects, and it was chosen by the building committee in preference to several others sent in by architects in different parts of the country. The structure will be built of Scrabo stone, quarried on the spot. Mr. W. Sharman Crawford, chairman of the building committee, delivered an address, as did also Sir Robert Bateson, who laid the stone, after prayer by the bishop of the diocese.

STRIKE AT DOVER.—A considerable number of bricklayers in the employ of Mr. Moxon, on the Government works on the Heights, resolved to strike—not for wages, nor from any ill-will to their employer, but simply from a resolution to choose their own foreman. Mr. Moxon discharged the whole, and immediately telegraphed to London for a reinforcement of men, who have supplied the place of the malcontents.

THE LONDON OPERATIVES AND EMIGRATION.—There have been other meetings of the unemployed besides that reported in our last. At Bethnal-green, between 4,000 and 5,000 persons were present. A resolution was passed appealing to the Government to recognise the urgency of the present crisis, and to take prompt measures to enable those who are starving here to emigrate to the colonies, where their labour and their skill, while raising themselves from destitution to the enjoyment of an abundance of the necessaries of life, would, by the development of the vast resources of these possessions, give a healthy stimulus to the industry and a sound and safe expansion to the commerce of the mother country. One speaker very reasonably urged that as so many millions had been freely given to feed the poor in Ireland, and to liberate the slaves in Jamaica, surely a single million might, if requisite, be given to supply our colonies with labour and our unemployed with work.

GAS.—At the half-yearly meeting of the Birmingham and Staffordshire Gas Company, the usual dividend, at the rate of ten per cent. per annum, was declared.——The Bingley Gas Company have issued a notice for the reduction of the price of gas, from 5s. 6d. per 2,000 cubic feet to 5s. from the 21st of December last. The quality of the gas, it seems, is not first-rate at present. The consumers may as well have cheap and bad gas as dear and bad, but the company would find it to their advantage to improve the quality of their gas while affording additional inducement (in price) to use it in private dwellings.——At the meeting of the Grimsby Gas Company, the directors reported that their works are in good repair, that since the last meeting a new gas-holder and tank have been constructed; that they intend to offer the old gas works for sale by auction during the spring, and hope to be in a position before long to reduce the price of gas. A dividend for the last half-year, at the rate of 8½ per cent. per annum, was declared, leaving a considerably increased balance in hand.——The Banff Gas Company have entered into a portion of the contracts for an addition to their works. The contract for mason work and excavations has been taken by Mr. Hunter, mason, Banff.

SHAKSPEARE'S HOUSE.—A meeting of the Birthplace Committee was held last week, and the *Birmingham Gazette* says, that "it was unanimously resolved to proceed no further in the work of conservation until the opinion of some eminent architect has been taken upon the subject." We are glad to find our advice has not been thrown away.

CANADIAN EXHIBITION AT THE CRYSTAL PALACE.—The Parliament of Canada voted last session a sum of 2,000*l*. for procuring a proper exhibition at the Crystal Palace of the products, both raw and manufactured, of that country, together with models of almost all the important public works there. A large space has been allocated for this purpose, and in a short time, says the *Canadian News*, an exhibition, exceeding in extent and interest that displayed by Canada at the "Exposition Universelle" of 1855 will be completed. A sum of about 500*l*. a year will be expended in maintaining and adding to the collection.

JOINERS' STRIKE AT DUMFRIES.—The journeymen joiners of Dumfries struck work for an advance of 3s. a week. The present wages vary from 15s. to 20s. a week—18s. being the general rate for good workmen. Except one firm, the master joiners refuse to agree to a general advance of 3s. but some of them state they are willing to give an increase where they think the workmen merit it.

HOLYHEAD HARBOUR.—Mr. John Hawkshaw, C.E. has been appointed, by the Admiralty, engineer in chief of the New Harbour Works at Holyhead, *vice* Mr. Rendel, deceased.

THE WELLINGTON MONUMENT AT LIVERPOOL.—We understand that the committee appointed to superintend the Wellington monument at Liverpool have resolved to adopt the design of the Messrs. Watson, of Edinburgh.

NOTICES UNDER THE BUILDING ACT. — In the case of the militia depôt about to be built for the city of London, the authorities refused to give notice to the district surveyor, Mr. Hammond, claiming it was exempt on the assertion that it was a building "employed for her Majesty's use or service." It was argued before a magistrate on the 10th, who decided that the building is *not exempt* from supervision of the district surveyor; and who fined the builder, Mr. Jay, after three days' hearing. The Court of Lieutenancy have given notice of appeal to the Court of Queen's Bench; but this, it appears, the builder repudiates.

ST. EUGENE, PARIS.—A correspondent writes,—"When in Paris I saw the church of St. Eugène, recently illustrated by you. To the lovers of out-and-out polychromy, it must be a treat: every imaginable colour (except black and white) plays its part: this, with gilding and stained glass windows, gives a curious effect. Were it not for the style of architecture, it would be a very appropriate building for a bazaar. There is no solemnity about the place: the mind is excited and disturbed with this gaudy colouring, and it does not seem that it would be a desecration to commit a polka therein. Very different are the feelings with which we enter and leave the old Gothic cathedrals in our country and in France."

"THE PEACE CONFERENCE."—M. Dubufe's picture commemorative of this event, painted for the Emperor of the French, is now on view at Messrs. Leggatt's, Cornhill. It is 17 feet long and 10 feet 6 in. high, and contains fifteen portraits,—Orloff, Clarendon, Cowley, Walewski, Buol, Cavour, Brunow, and the rest, of the size of life. The figures are skilfully grouped, and the result of the whole is very excellent. It takes rank amongst the finest works of its class.

PORTLAND CEMENT FRONTS.—Will you allow me the use of your columns to ask a question? My house, situated in the country, has been altered, enlarged, and stuccoed. The Portland cement, it was said, would "set" of one uniform stone colour; but instead of that, I find it sadly mottled, although it is upwards of three years since it was done. What is the remedy? The painter recommends oil paint: good taste forbids; it would be too shiny; and as the surface is extensive, the expense would be an objection. The plasterer recommends a wash, which I fear would require renewing annually. Many besides myself would be glad to be informed how such a difficulty is to be met with good effect as regards appearance, and with moderation in the demand upon the pocket.—RUSTIC.

THE LITERARY FUND SOCIETY.—At the annual general meeting of this admirable and important Society, held on the 11th instant (Earl Stanhope in the chair), another attempt was made to pass a vote of censure on the committee, but which, being altogether groundless, utterly failed, notwithstanding the position and abilities of the objectors, Mr. Dilke, Mr. Dickens, and Mr. John Foster. Mr. Robert Bell, Mr. Monckton Milnes, and the Bishop of Oxford spoke on the other side. In answer to some charges against the committee in respect of the late Mr. Haydn, which have been industriously circulated, a triumphant reply was given, and the meeting showed their full appreciation of it by voting sixty-nine against the motion, eleven for. Unanimous testimony was borne to the value of Mr. Blewitt's services as secretary.

BRANCOTE CHURCH COMPETITION. — Correspondents complain, and with good reason, of the terms put forth in this matter, which end with the intimation that "The committee do not intend to give any premium or other remuneration for designs, and will not bind themselves to accept any of the designs which may be sent in." But what can we say more than we have already said a thousand times? While architects are to be found who will send designs, no matter what the conditions may be, it is hopeless to expect improvement.

SALE OF GENUINE PICTURES.—On the 18th inst. Messrs. Foster will sell a number of first-rate drawings and paintings, the property of Mr. Lewis Pocock, F.S.A. who has purchased so many pictures during the last few years, that he now finds some of them in the way. The sale will include Millais's "Proscribed Royalist," Linnell's "Wold of Kent," Dobson's "Children in the Market-place," and many charming specimens, by E. M. Ward, F. R. Pickersgill, Goodall, Frith, Holman, Hunt, Leslie, John Lewis, Webster, and others.

MILBORNE REFORMATORY. — This Reformatory School is now ready for the reception of boys convicted under the 17th and 18th Vict. c. 86, and similar Acts. It is built upon the most economical principle consistent with health and comfort, and consists of a large school-room, two sitting-rooms, a kitchen, and small store-room on the ground floor; a dormitory for twenty boys, two bed-rooms, and an hospital on the first floor. A master, matron, and bailiff will have the supervision of the boys.

COUNTY SURVEYORSHIP, ESSEX.—The following gentlemen were selected from fifty-eight candidates;—Mr. Whichcord, London; Mr. Smith, Hertfordshire; Mr. Webb, Chelmsford; Mr Chas. Forster Hayward, Colchester and London; Mr. Chancellor, Chelmsford; Mr. Pritchett, Bishop's Stortford; Mr. Phipson, Ipswich and London; Mr Henry Stock, London; and Mr. Crewe, Aldershott Camp. The latter five gentlemen have been chosen for further selection in April next, when the election is expected to take place. The salary is 300*l.* per annum.

LETTERED GLASS SCREENS: GLASS TRADE ALMANAC.—The globe and other gas-lights in shop windows are now being improved in effect by lettered screens of ornamental glass, made to serve the purposes of advertising shop goods, &c. and which might also be made very serviceable in pointing out the thoroughfares after dark, if applied to the public lamps. The effect of these screens is attractive, and decidedly good. They form the subject of a patent secured by the Cosmopolitan Gas Company, in Oxford-street, one of the managers of which firm, we observe, has just published a handy office sheet, in form of an almanac, with borders usefully occupied with a good deal of interesting information on the subject of the glass trade and manufacture in its various branches.

"ARCHITECTURAL SKETCHES FROM THE CONTINENT."—Messrs. Day announce a work under this title, consisting of a series of views and details from France, Italy, and Germany, by Mr. Richard Norman Shaw, architect. The author says,—"While every corner of the United Kingdom has been ransacked for fresh examples, and nearly every building of note has been more or less illustrated, many of the most beautiful works in France, Italy, and Germany remain entirely untouched, and very little known. This is, perhaps, chiefly remarkable in the case of France, the country of all others the most accessible, and undoubtedly the most richly stored with the triumphs of mediæval genius."

THE METROPOLITAN BOARD AND THE NEW PARK FOR FINSBURY.—At the ordinary weekly meeting of the Metropolitan Board of Works on the 6th inst. a report from the Committee of Ways and Improvements was presented, recommending the Board to replace the Bill of the Finsbury-park promoters by a new Bill of their own; to consider whether the expenses incurred by the promoters should be paid by the Board; and, in the event of adopting the Bill, to retain the services of Mr. Barnet, surveyor, in its prosecution. The recommendations of the committee, after some discussion on proposed amendments, were agreed to by a majority of nineteen to twelve.

ST. JOHN'S CATHEDRAL, LIMERICK.—According to the design of the architect, Mr. P. C. Hardwick, this church will comprise a nave, two aisles, north and south transept, chancel, four side chapels, and a tower. The tower will be reared in the angle formed by the projection of the north transept beyond the aisle. Two sacristies will be erected to the eastward of the chapels. The total length of the church, chancel inclusive, will be 168 feet; width across transepts, 116 feet,—across chancel and chapels, 118 feet,—across nave and aisles, 74 feet; depth of chancel, 43 feet; height of nave to underside of ridge, 77 feet 6 inches; external height of west front, 88 feet 6 inches, from ground line to top of cross. The tower will be upwards of 200 feet in height, and at base 37 feet 6 inches in breadth.

LIVERPOOL ARCHITECTURAL SOCIETY.—At the eleventh meeting of the present session of this society, held on Wednesday, the 4th, Mr. James Hay, Vice-President, in the chair, a paper by Mr. W. Imray, "On Improved Machinery for the Manufacture of Bricks," was read.

RISE IN VALUE OF SANDSTONE AT BANFF.—Owing to the large demand for sandstone, says the *Banffshire Journal*, occasioned, it is said, chiefly by the large quantity required for the railway bridge across the Spey, the price of the stone has risen, in this district, within a short period, by 3d. a cubic foot. The stone for the bridge is said to be chiefly from the Covesea quarries, in Morayshire, known for hard close grain.

ARCHITECTURE IN NEW ZEALAND.—Under the heading of "Our Want of Practical Architecture," the *New Zealander* says, "This is a want we have more than once had to speak of in reference to our public buildings in this city; and both from editorial articles and newspaper correspondence we learn that the decision of the Architectural Commissioners of Wellington, with reference to the plans for the proposed new Government Offices and Assembly Houses in that city, has met with anything but general approval. One writer, 'Public,' deals with the several designs very sensibly (his remarks, indeed, have more than a merely local application), and shows that not one is suited to the province or the locality where the edifices are proposed to be raised: all are too costly and ambitious: none are characterized by that unity and simplicity, and regard to judicious economy, which are all so requisite in young countries—even in the Empire City. The critic thus concludes his review of the first prize design:—

'In this design there is nothing for Wellington to feel proud of,—no display of good workmanship, practical knowledge, architectural ability, or the principles of construction suitable to this province. The committee think that a design may be *made up* out of three accepted designs,—but how a row of cottages with two Vandalised porticos, a Gothic building, and an Italian villa, can be amalgamated, is a puzzle.'"

ARCHES.—Allow me to enter into a few particulars on this subject, and at the same time to point out what I consider a great defect in the common arch. In the ordinary radiating arch, resistance to upward pressure is effected by loading, which, however, is only efficient to a certain extent, and that in some instances very limited. Now, I propose to construct arches in such a manner that resistance to upward pressure should be obtained in the arch itself. For this purpose, the arch stones should be so made as to fit into one another in such a manner, that no arch stone can move on account of the ones on either side of it. According to the form of the arch, whether semicircular, elliptical, or otherwise, so will be the form of the voussoirs. It is difficult without diagram to show how the form of the key-stones could be got, but if from the upper end of an ordinary radiating key-stone a vertical line be let fall (which of course will be parallel with the line representing the rise of the arch), and the height of the key, or any other stone be bisected by a line drawn from the centre of the arch, where this bisecting line intersects the line whose top represents the upper end of the key-stone, a line should be drawn to meet the vertical line first spoken of, where it cuts, or would seem to cut, the under line of voussoirs. The same process should be gone through on the opposite side of the keystone, and thus the key-stone would become of such a shape as to be incapable, when surrounded by the rest, of moving upwards or downwards. When this has been done, the same process should be gone through with all the stones in such a way that the, so to speak, projecting parts of every stone should fit in and hold together the indented parts of the neighbouring ones, and *vice versâ*. As, when this has been done, no stone can move on account of the stones on either side of it—and this is the case with all,—it must follow that the arch itself as a whole is incapable of motion if rightly constructed. An arch of this sort would, of course, be in stable equilibrium, and would stand without abutments if the foundations were sufficiently strong, but like all others, it would be better with them.—J. A. D.

TUNNELLING IN THE BHORE GHAUT.—The *Bombay Times* says the slope or incline intended for the rails at the Bhore Ghaut is nearly 15 miles in length, ascending between the two points at an elevation of 19,000 feet. Stretching along the face of the precipice, the line is every now and then seen to plunge by tunnel into the bosom of the rock; to shoot by some light airy viaduct across the chasm, or extend itself over the more substantial-looking support of an earthwork. About three-fourths of it crosses one of these, containing no less than 200,000 cubic yards of material. There are in all twelve tunnels, measuring between them 2,300 yards, or about a mile and a half. These works were commenced under the auspices of Mr. Faviell, the contractor, in January last: the contract is to be completed in February, 1861, at a charge of 634,000*l.* There are at present ten thousand workpeople employed on this part of the line, the average pay being about 1,500 rupees a day. The cost of the whole work amounts to from 10,000*l.* to 12,000*l.* a month. There are 3,000 men employed in boring or jumping the rock. The charge of each mine amounts on an average to about 12lbs., and about a ton of gunpowder (made on the spot) is consumed daily. Near Poona, Mr. Faviell employs 7,000 people, and the line from the top of the incline to Poona will be opened before the rains in 1858.

HOUSE-BUILDING AND RENTS IN PARIS.—The Prefect of the Seine reports that the number of houses pulled down in the last five years amounts to 2,534, whilst the number of new buildings is 5,238, or more than double of the former, and that inquiries made in the arrondissements of St. Denis and of Sceaux show that in the suburbs the houses newly constructed surpass sixfold the number pulled down. Thus, in Paris and the suburbs, 18,594 houses have been constructed, against 4,667 houses pulled down. The prefect also states that the old houses were not more subdivided, nor contained a greater proportion of lodgings, than those recently constructed in their place. It is thus maintained that the increase of rents does not proceed either from the diminution of the number of houses or of the number of lodgings; and the prefect points out that it proceeds from the rapid increase of the population of the capital, and from the number of foreigners and persons from the provinces, attracted by the facility of communications, the population of the capital having increased, in the last five years, 305,000. "Houses," says the *Constitutionnel*, commenting on the prefect's report, "cannot be built by enchantment. There is a limit to the capital applied to building. But as the money invested in houses gives so excellent an interest, the building movement, far from diminishing, cannot fail to spread. The incessant multiplication of lodgings will forcibly bring about a fall in rents, a result that cannot long be delayed, thanks to the measures of the administration.

PRICE OF BUILDING GROUND AT PLAISTOW.—Some land in the vicinity of Plaistow-marshes, bought ten years ago at 100*l.* an acre, has recently been sold for building purposes at the rate of 1,200*l.* an acre.

PATENT SAFETY HOIST.—A specimen of Baines's patent hoist has been fitted up in a new warehouse in Portland-street, Manchester. According to the local *Courier*, Mr. Hugh Baines, of Manchester, architect, claims for his invention that by it accidents from the breaking of the rope are impossible. As soon as the rope or chain is severed, a strong reverse spring of vulcanised India-rubber comes into action; and the result is to throw out levers or legs, which catch in the teeth of racks, and safely suspend the hoist and its contents. The cage cannot fall more than the depth of one notch in the racks; and the jerk that would result from the sudden check is much reduced by giving to each of the arms a strong buffer joint.

TENDERS

For the construction of the foundations for a coal depot, near the Creek at Deptford, for Messrs. Smith and Wiethers; Messrs. Tillott and Chamberlain, architects. The quantities not supplied:—

Thos. Rider	£1,054 0 0
Wm. Wills	1,025 0 0
S. B. Hocken (accepted)	997 0 0

For the erection of a new residence at Coddington, near Newark, for James Thorpe, esq. Beaconfield; Mr. Charles Baily, architect:—

Thomas Lane, jun. Newark	£1,684 0 0
Ferguson and Allen, Nottingham	1,600 0 0
James Henderson, Newark	1,564 0 0
C. C. and A. Dennitt, Nottingham	1,516 0 0
Charles Ward, Lincoln	1,470 0 0

For the rebuilding of tower and spire to the church of St. John of Beverley, Whatton, Notts.; Mr. Charles Baily, architect, Newark-upon-Trent:—

	Tower and Spire, Ancaster Stone.			Tower and Spire, Bulwell Stone.			Tower only.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.
C. C. and A. Dennitt, Nottingham	1549	0	0	1499	0	0	1249	0	0
Ferguson and Allen, ditto	1550	0	0	1375	0	0	1085	0	0
William Lee, Retford	1190	0	0	1190	0	0	925	0	0
James E. Hall, Nottingham	1185	0	0	1165	0	0	865	0	0

TO CORRESPONDENTS.

W. H. T.—An Architectural Student (look to the regulations of the society from whom aid is to be sought).—C. F. H.—C. B.—C. C. M.—T. and C.—J. A. B.—C. H. W.—S. S.—E. S.—C. B.—R. H.—T. G—The Parks.—Aristides.—R. S.—G. W.—H. J.—Rev. W. B.—A Lover of Fair-play.—S. M. S. (the request, although reasonable and proper, could not be enforced).—J. A. P.—W. H.—T. M'A.—J. N.—W. and M.—J. S.—J. L.—C. S.—C. B.—Mr. B.—P. S.—B. L.—R. B. E.—G. H.—J. H. H.—Regular Subscriber.—Fashion and Style (in type).—A. B.—A. M.

"*Books and Addresses.*"—We are forced to decline pointing out books or finding addresses.

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AN ARCHITECT, a Fellow of the Institute, who holds public appointments and practises in a city about two hours from town, has a VACANCY for a PUPIL.—Principals only will be communicated with.—Address, N. D. Weale's Architectural Library, High Holborn, London.

CLERK of WORKS WANTED, to superintend the Sewerage Works of a large town. A good practical man will be preferred, as the surveyor of the town will attend each day to give directions as to levels, &c. None need apply who have not been engaged on similar works, and cannot be strongly recommended by their last employers, as testimonials will not be attended to. A liberal salary will be given.—Address, C. E. Post-office, Luton, Beds.

TOWN TRAVELLER WANTED for the sale of an article extensively used by builders. None need apply but those having a knowledge of the trade and can give unexceptional references, and by letter only, to F. L. Mr. George Serjeant, 80, Newgate-street, E. C.

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PARTNERSHIP.—A Gentleman possessing capital wishes to meet with an established Builder who requires an active PARTNER. He has been many years in the employ of a London firm, and is well acquainted with the business.—Address, prepaid, to K. K. care of Mr. Johnson, 24, Broad-street-buildings, City.

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TO ENGINEERS, CONTRACTORS, and TOLL COLLECTORS.—FOR SALE, by PRIVATE CONTRACT, a SUSPENSION BRIDGE, situate on the most direct road between the towns of Usk and Abergavenny, with right of taking toll, or removal of the bridge, at the option of the purchaser. The tolls, during the last ten years, have averaged upwards of 100*l.* per annum. The bridge is a handsome structure, designed by the late Sir S. Brown; the chains are supported on cast-iron piers, easy of removal. It would be suitable for heavy road traffic, over a span of 146 feet; width, 23 feet.—Further particulars may be obtained on application to Messrs. BLOUNT and DAVIS, Solicitors, Usk; or to Messrs. MAY and COOKE, Civil Engineers, Newport, Monmouthshire.

FOURTEEN short LEASEHOLD HOUSES TO BE SOLD, to pay above 40 per cent. Lease directly, always well let, good locality, and lately put into repair. This is a rare chance for a working man, who could live on the premises. Price 250*l.* — Apply, pre-paid, to W. B. 16, St. James's-road, Victoria-park, N.E.

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WANTED to PURCHASE, substantially-built FREEHOLD HOUSE PROPERTY, let upon repairing leases. About 5,000*l.* are required to be invested.—Address to Mr. GEO. HILL, Stanley Villa, Hammersmith, W.

SIR W. S. HARRIS'S PATENT system of LIGHTNING CONDUCTORS FITTED, as applied to the Houses of Parliament, many public buildings, cathedrals, churches, &c.—Apply to J. W. GRAY and SON, 55, King William-street, City, E.C.

TO BUILDERS, PLUMBERS, and OTHERS.—LEAD WORKS, HAMMERSMITH.—F. CLARK and SON, Lead Merchants and Manufacturers, are giving 21l. per ton for OLD LEAD, if delivered as above, or to any part of London. Cash on delivery.—Sheets, Pipe, Pumps, and Composition Gas Tube, sold or exchanged, at lowest possible prices.

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W. and R. STANNARD, LOOKING-GLASS and PICTURE-FRAME MANUFACTURERS, begs to inform the above they can be supplied with Gold Bordering for rooms at reduced prices. 10,000 yards kept ready gilt for delivery. The Trade supplied with fancy wood and gold mouldings in the lengths.—4, Middle-row, Holborn, London, W.C. Pattern List, with prices, free by post.

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Manufactory—Kingston India-Rubber Mills, Bradford, Wilts.

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N.B. From this Testimonial it will be seen that the CORROSIVE WATER of the ISLE of WIGHT has no effect on Gutta Percha Tubing.
THE GUTTA PERCHA COMPANY, PATENTEES, 18, WHARF-ROAD, CITY-ROAD, LONDON.

HANCOCK'S PATENT VULCANIZED INDIA-RUBBER TUBING, HOSE-PIPES, WASHERS, ENGINE-PACKING, both round and flat, and SOCKET-RINGS for Hot-water-pipes. Vulcanized Rubber Door-springs, and Solid Round Rubber Cord of all sizes of any length. Billiard Cushions and Rubber Strips cut to any pattern for bagatelle tables.
Diving-dresses of superior make, and improved Vulcanized Rubber Supply-pipes for ditto.
Vulcanized Rubber, in sheets, from three to four feet wide, and of any thickness. Air-beds, Pillows, and Cushions inflating Portable Baths, Invalid Cushions, and Articles of this kind made to any pattern to order.
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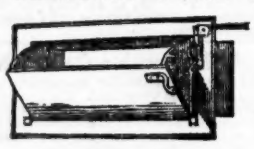
Sheringham's Ventilator for the admission of pure air through an



EXTERNAL WALL.

With single pulley, from 6s. each; with leading pulley, from 8s. 6d.
These Ventilators are arranged that the requisite quantity of air may be admitted for the due ventilation of an apartment without the slightest draught being felt by the occupants; and as they are placed in the external wall, their action is not impeded when the house is closed for the evening, at which time a constant supply of fresh air is most required.—HAYWARD, BROTHERS, sole Manufacturers, 196, Blackfriars-road, and 117, Union-street, Borough; and of all respectable Ironmongers, Builders, &c.

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SMOKY CHIMNEYS.—TWO YEARS' TRIAL, and PERFECT SUCCESS of SUTER'S PATENT WIND-GUARD, in curing the most inveterate Smoky Chimneys, induces the Patentee to recommend all persons suffering from that nuisance to try one.
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Prospectuses and Scrip (to be exchanged for Shares) may be had at the Offices, No. 17, Broad-street-buildings, City.
W. RAIT, Secretary.

AT the LOWEST CASH PRICES.—SAMUEL PUTNEY invites the attention of buyers to his large and well-selected STOCK of DEALS, and the reduced Prices of prepared Flooring, &c. Mahogany Planks, from 6d. per foot.

Inch Yellow Flooring	18s.	per square.
4-inch ditto	15s.	"
Pine Plank, 12 3 by 11, from	£21	per 120
Yellow Deals, from	20	"
Spruce Deals, from	18	"
Yellow Battens, from	12	"

N.B.—All Sawn Goods delivered within two miles free of cartage.
Borough-road, Southwark, and Elm-street, Gray's-inn-lane.

FLOOR BOARDS, &c.—R. SLADE begs to inform Builders and the Trade, that he has now on hand a large assortment of FLOORING and MATCHED BOARDING from ¾ inch to 1¼ inches thick, seasoned, and ready for use; also Mahogany, Moulding, Wainscot, and all kinds of Timber required for Building purposes.—Address, R. SLADE (late E. Simms), Flooring Manufactory, Wilton-road, Pimlico.

TO BUILDERS AND OTHERS.

AT the LOWEST PRICES.—TIMBER, DEALS, MAHOGANY, and WAINSCOT. A large assortment of seasoned prepared FLOORING and MATCH-BOARDING of all descriptions. Also an extensive stock of Dry White Yellow, and Pine Cut Stuff, Slating, Battens, Pantile Laths Oak Plank, Sash Cills, &c. Timber of all kinds, Planks, Deals and Battens, fetched from the docks, sawn by patent machinery in the best manner, and delivered at the shortest notice.—THOMAS JACKSON, Sawing and Planing Mills, Commercial-road, Pimlico, London.

WITHIN five minutes' walk of the London Bridge Railway Stations.—THOS. W. ELLSTON begs to invite the attention of builders and consumers generally, to his large and well-assorted STOCK of DEALS, PREPARED FLOORING-BOARDS, MATCHED LINING, &c. at the lowest possible prices for cash. Inch by 9, Yellow Prepared Floor Boards, 18s. per square; ¾ inch, Yellow Prepared Floor Boards, 15s. per square.—A price-list forwarded on application. All sawn goods delivered free of cartage to any of the London railway stations.
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EDWARD SIMMS begs to inform Builders and the trade, that he has now on hand at his manufactory (the first of its kind ever established), a large assortment of PREPARED FLOORS and MATCH BOARDING, seasoned and ready for use, from ¾-inch to 1¼-inch thick, in White or Yellow Deal, Oak, or Pitch Pine. Also Dry Deals, in all thicknesses, Slating Battens, Pantile Laths, Oak Sills, Plank, and Scantlings. Mouldings in clean Pine, to any design. A pattern list forwarded on application.—Address, E. SIMMS, Flooring Manufactory, and Sawing, Planing, and Moulding Mills, King's-road, Chelsea.

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ANOTHER GREAT REDUCTION.—Yellow Deals, 3s. 4d; Spruce, from 3s.; Pine Plank, from 3s. 6d.; 2½-inch Yellow Battens, from 12; F. Walnut, 8d. per foot; Mahogany, 6½. per foot; Prepared Floor-boards, 13s. 6d. Cartage free to any part of town.—T. FORMAN, 1, Walnut-tree-walk, Lambeth, S.

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SAWING, PLANING, AND MOULDING MILLS,
KING'S-ROAD, CHELSEA.

ST. PANCRAS SAWING, PLANING, and MOULDING MILLS, Cambridge-street, Old St. Pancras-road.—GEORGE NOKES and CO. invite the attention of Builders and the Trade generally, to their STOCK of DRY FLOORING, at the following prices, for cash:—
¾-inch white, 13s. 6d. per square; ¾-inch white, 15s. per square; 1-inch white, 18s. per square; 1-inch yellow, 15s. per square; ¾-inch yellow, 16s. 6d.; 1-inch yellow, 20s.
Timber, deals, planks, &c. at the lowest remunerative prices. A liberal discount allowed on mouldings for exportation. Book of designs forwarded on application.

ALFRED ROSLING begs to inform his Customers and the Building Trade generally, that he is enabled to allow a discount of 15 per cent. upon his list prices for Mouldings.—A large stock of dry flooring at low prices.—Southwark-bridge Wharf, Bankside.

JETT'S WHARF PATENT SAWING, PLANING, and VENEER KNIFE-CUTTING MILLS, Commercial-road, Lambeth. The Proprietors beg to announce to the Trade that they have completed their extensive arrangements, and will be happy to execute all orders entrusted to their care with despatch and punctuality. Wet and dry docks, and powerful cranes for landing heavy goods, offer facilities not to be obtained elsewhere.
A LARGE ASSORTMENT OF SEASONED PREPARED FLOORING, MATCH BOARDING, &c. &c. ALWAYS IN STOCK AT REDUCED PRICES.

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CANAL BRIDGE, OLD KENT-ROAD, LONDON.
A Monthly Price Current forwarded on application.
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THE LIZARD SERPENTINE COMPANY manufacture and sell in block and slab the beautiful stone now raised from the lower beds of their quarries. Chimney-pieces, Columns, Fonts, and ornamental works on view, at 20, Surrey-street, Strand.
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THE largest STOCK in England of MARBLE, in Blocks and Slabs, veined, Brocatilla, dove, black, black and gold, Sienna, St. Ann's, statuary, serpentine, verd antique &c. Portland, Harehill, Park Spring, and other stone, in blocks, slabs, landings, and headstones. Yorkshire paving, granite curb, &c. All goods carefully packed and forwarded to any part of England.—THOMAS JAUKSON, Marble and Stone Sawing Mills, Commercial-road, Pimlico, London.

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W. HADFIELD, Agent to A. BEERNAERT, Brussels.
The trade supplied on liberal terms.

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MARBLE CHIMNEYPIECES and every other description of marble work supplied to architects, builders, and the trade, at prices to compete with slate, manufactured by the London and Continental Marble Company. Paving for halls, conservatories, &c. Marble indurated and rendered impervious to stains by Page's Patent Process.—Offices and Depot, 3, Crooked-lane, London-bridge.

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Marble of all kinds and of best quality, in block and slab, Marble Mortars, &c.

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London Agents—TREGELLES and TAYLOR, 54, Old Broad-street. Manager—JAS. J. TRATHAN, Liskeard.
This Granite is selected for the New Westminster-bridge.